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YAWS AND SYPHILIS: A CRITICAL REVIEW.

By Hugh S. Stannus,
Sectional Editor, Tropical Diseases Bureau.

In consequence of the recognition of the widespread distribution of these two diseases among the native populations of tropical countries and the important part they play in causing invalidity and more serious crippling among them, yaws and syphilis have been treated in separate sections in the *Tropical Diseases Bulletin*, and the present article is an attempt to collate the information contained in the papers which have come under review during the past few years. The scope of this article is therefore limited, but it may at all events serve to show how many are the lacunae in our knowledge and how diverse the opinions held by various observers in consequence of this want of exact knowledge. For the sake of convenience of comparison both diseases will be considered together in dealing with geographical distribution, but from the clinical and pathological aspect they will be discussed separately.

Geographical Distribution. Yaws: Syphilis.

Nigeria.—(Pop. 19,000,000.) 1,000 cases of yaws were treated at Government hospitals in 1922, but no details are given.

For syphilis the figures are: 395 primary, 899 secondary, 41 inherited, with no mention of tertiary cases. For 1923, 278 and 1,127 cases of yaws were treated respectively as in- and out-patients, and of syphilis 201 in- and 362 out-patients for primary, 470 and 658 for secondary and 19 and 17 for inherited disease. At the same time in the disease tables a number of cases of paralysis, aneurysm, condylomata, etc., are registered, suggesting that the figures given for syphilis are unreliable. This is further borne out by the statement that while yaws is relatively uncommon venereal disease is widespread, but no special measures or antivenereal campaign have been put in force.

Gambia.—(Pop. 9,395.) In 1922 no cases of yaws returned, and while syphilis is said to be rife only 38 cases, all except 3 being primary, are shown.

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Gold Coast.—REINDORF (1922–23) at the local venereal disease clinic treated 150 cases of syphilis and 2,517 of yaws, nearly half of whom were children. In 1923–24, 451 cases of syphilis were so treated, and for the whole colony 1,311 syphilis and 5,312 yaws. No case of tertiary manifestations of syphilis is mentioned, the secondary cases being about twice as numerous as the primary. Galyl and N.A.B. were apparently being used for treatment.

Sierra Leone.—In 1923, 144 cases of yaws, 48 cases of secondary syphilis, and 494 cases of the inherited disease were treated (Galyl and N.A.B.). A statement is made to the effect that the native is apathetic in seeking treatment and "in the meantime may be spreading the disease far and wide." These figures point obviously to a very unsatisfactory state of affairs.

Uganda.—(Pop. 1,500,000.) In 1922, 819 cases of yaws and 5,346 new cases of syphilis were registered, with details of the latter, as follows : Primary, 219 M., 33 F. ; secondary, 820 M., 457 F. KEANE estimated in 1921 that 80 per cent. of population had or had had venereal disease, and that 20 per cent. were contagious. No cases of inherited disease apart from those classed as congenital are mentioned. In 1923 the total cases for syphilis is given at 11,505 ; for yaws, 3,376. In this colony, wherein a campaign against syphilis was instituted some years ago, a total of 100,000 injections was given in the year, treatment being by mercury and N.A.B. (when available), but only 17 injections of bismuth were tried. WEBB includes yaws among "other venereal diseases," and says that all cases must be treated as syphilis whether they be syphilis or yaws, a policy which is open to grave criticism as confusing an important problem, namely, the relation of the two diseases to each other and the part each takes in the production of late manifestations ; the question of treatment is also intimately connected with this policy since mercury is useless in yaws. In the diseases tables, apart from venereal diseases and yaws, nearly 1,500 cases of neuralgia, 26 of paralysis, 16 of optic neuritis are reported and others under the headings, condylomata, aneurysm, etc. ; also 11,000 cases myalgia. It would be interesting to have a more definite diagnosis in these cases ; some of them are almost certainly syphilitic in nature, and in view of the observations by French workers that headaches and pains in the limbs were in a large proportion symptoms of syphilitic infection relieved by antispecific remedies, it seems possible that these cases in Uganda are worthy of further investigation.

Kenya Colony.—(Pop. 2,500,000.) In the Report for 1922 figures are given by GILKS relating to the past 15 years. During that time one to two thousand cases of syphilis were treated each year, the incidence varying greatly in different localities. The figures for yaws, however, make a very different picture. Up till 1919, 200–300 cases only were returned each year. For 1919 and 1920 the numbers were 600 odd cases each. For 1921, 7,401, and for 1922, 21,733, the last figures corresponding with the recognition of the prevalence of the disease in the Kikuyu and S. Kavirondo Native Reserves, and with the beginning of measures to deal with this endemic. It was estimated that 60,000 cases would have been treated in 1923. Bismuth is here almost exclusively in use for the treatment of yaws.

Tanganyika Territory.—(Pop. 4,100,000.) Figures are given by DAVEY for cases treated in Government hospitals. During three consecutive years :—

	1921.	1922.	1923.
For yaws	1,109	3,123	3,593
For syphilis—			
Primary	697	569	716
Secondary	1,723	1,481	1,638
Inherited	39	74	253
Tertiary	—	21	—

The cases of yaws were found in the country bordering on Lake Tanganyika, in the S.W. Province and N.E. area. One-third of the total cases of syphilis were reported from the Bukoba and Mwanza hospitals in districts where it is estimated that 70–90 per cent. of the population is infected. 50 per cent. male and 25 per cent. female inmates of the prison at Bukoba were syphilitic. On the other hand, among 2,000–3,000 labourers recruited at Tabora less than 1 per cent. showed signs of the disease, a figure corresponding to an observation made by JOHNSTONE among the Kavirondo of Kenya. Treatment in Tanganyika Territory for these diseases is by 2 gr. doses intramuscularly at 5–7 days intervals of bismuth sodium potassium tartrate. There are also references to yaws in Tanganyika Territory by REID, and in Nyasaland by DYE (see later). Syphilis and yaws are, of course, also widely distributed over *Nyasaland, Portuguese East Africa* and *N. Rhodesia.*

Mauritius.—(Pop. 377,594). There is no mention of yaws in the Report for 1923, but syphilis is stated to occur all over the island, and the proportion of 254 cases syphilis (43 primary) to the total 82,326 sick treated at hospitals and dispensaries probably in no way gives an approximation to the truth.

South Africa.—No general statistics are available with regard to either disease, but judging from a discussion by FREW and others (1924) upon the problem of syphilis as it occurs among native labourers on the Rand Mines, the disease is not uncommon and the Government has not yet instituted any antivenereal campaign among the native and coloured inhabitants. PIJPER (1921) (1924) found among 500 native and coloured people attending the Pretoria hospital without obvious signs of the disease, a positive Wassermann reaction in 57 per cent., and takes this as an index of latent syphilis among the general non-white population, or he estimates them at 8,500 in a population of 23,000. In 2½ years over 2,000 cases of the disease were treated at the same hospital.

Basutoland.—MACFARLANE (1923) refers to the prevalence of syphilis among the Basuto, but says that it is not so terribly destructive as it was 28 years ago. MCARTHUR (1923) has dealt with the subject in *Bechuanaland*, and though much interesting information is contained in his paper many of his observations are possibly invalidated by his claim that a certain condition of the scalp called "witkop," since shown to be associated with an achorion infection, was a manifestation of inherited syphilis.

Cameroons.—NOEL (1921) describes cases of yaws, while THIROUX (1922) states that the incidence of syphilis is very heavy ; the infant

mortality lies between 42–63 per cent., JULLEMIER ascribing syphilis as the chief cause followed by malaria and ankylostomiasis; in this he receives confirmation from ZIEMANN (1923).

On the *Ivory Coast*, BOTREAU-ROUSSEL (1924) (1925) believes that yaws is widespread in the hinterland, while THIROUX states that 50 per cent. of the women in the urban centres are infected with syphilis, many children are said to show signs of the congenital disease, and still-births are estimated by LOUYS at 36–55 per cent.

In *French Congo* and *Chari-Tchad* region syphilis also occurs. CHAPEYROU (1922) states that a third of those treated in hospitals are affected. CLAPIER (1921) saw 2,000 yaws cases in a population of 45,000 in Bas-Oubangui, and 20 per cent. of the children showed framboesial eruptions.

PORTOIS (1924), VAN NITSEN (1920)(1924) and VAN DEN BRANDEN (1922)(1924) deal also with yaws in the Congo, and MATTLET (1924) and MIGUENS (1924) in *Urundi*, where the disease is common, secondary eruptions in children and tertiary yaws lesions in adults, with no mention of syphilis.

In *Senegal* yaws is rare, according to NOGUE (1923)(1924), who only saw 4 cases in 4 years at Dakar. Syphilis, on the other hand, is rampant. Of all patients treated at hospital practically 100 per cent. are syphilitic; still-births constituted 17 per cent., and 42 per cent. of children die before the age of 4 years.

In *Italian Somaliland*, ANDRUZZI (1924) saw cases of both yaws and syphilis.

At *Djibouti*, NÉAL (1924) notes syphilis, and THIROUX remarks that though little is seen among the native population, 18 out of 500 European residents contracted the disease.

CANTLIE (1923) deals with yaws in *Mongalla Province* in a recent paper and FUSCO (1922) in *Libya*, where the first case was observed in 1912. CASONI (1915) there collected only 10 cases of yaws in 4 years. On the other hand, the Arabs in this country he believes to be 100 per cent. infected with syphilis.

Madagascar.—No figures for yaws are reported from this island, but in the 16 years ending 1920, 39 per cent. of the total population of 3,500,000 was treated for syphilis. In 1911 the percentage of syphilitic babies was 28, in 1920, 43·5. ALLAIN and AUGAGNEUR (1923)(1924) state that in 1922 over 30,000 cases were treated—387 for primary, 4,342 for secondary, 22,644 for tertiary, and 3,281 for congenital disease. For 1923 these figures are nearly doubled all round.

For *Angola* no figures have come to hand, but syphilis is undoubtedly common, as NEVES (1923) refers to the antivenereal campaign which has there been started.

Syphilis is known to be widespread in Morocco and throughout the countries of *N. Africa*, but no figures are available; yaws, on the contrary, is unrecorded.

VON DÜRING (1916) says of syphilis in *Turkey* that it is rare in the interior, but common in Constantinople, where 60 per cent. adults are affected, the infection generally being gained in childhood. 100 out of 150 children at a school showed signs of the disease.

CHRISTIDI (1922) stated that this disease is common in *Persia*.

For *India* no statistics are to hand, but in some areas syphilis is widespread ; this is true, according to LEGER (1923), of the French settlements. The disease is said to be spreading in Bombay, and an antivenereal disease league has been inaugurated. POWELL (1924) has alluded to the heavy incidence—7–10 per cent— of syphilis among coolies in *Assam.* The same author has recorded the introduction of yaws into Assam ; there is no information as to how far it has spread, but there is an interesting paper by RAMSAY (1925) (1,000 cases), and KNOWLES (1923) has also written from that country.

Ceylon.—(Pop. 4,000,000.) The admissions to Government hospitals for 1923 on account of syphilis are given as 4,321. During the same period about 10,000 cases of yaws were treated with salvarsan derivatives at the same institutions. The total number of cases of yaws in all provinces is estimated at 150,000. No details are given, and bismuth is apparently not used.

Federated Malay States.—(Pop. 1,324,890.) In the Annual Report for 1923 it is stated that campaigns against syphilis and yaws are being actively promoted. In the venereal clinics 29,675 injections of N.A.B. were administered in the year, and during the same period injections of N.A.B. were given to 31,135 yaws patients, as against 22,972 in 1922.

Siam.—(Pop. 8,000,000.) In the report for 1922 yaws is reported as being epidemic from time to time in certain districts, and syphilis is said to be spreading, but conditions have not so far allowed of any measures for controlling and treating this disease.

China.—HSU (1925), at a clinic for genito-urinary disease in Shanghai among 1,077 patients in 1923, saw 338 suffering from syphilis, all with primary chancre.

THIROUX states, in referring to the incidence of syphilis in Indo-China, that it is heavier in *Cochin-China* and *Annam* than in *Cambodia, Tonkin* or *Laos,* quoting KERMORGANT, who represents a third of the population of Annam as suffering from the disease. MONTEL (1920) also refers to the disease as rife in Cochin-China. There are also references to Annam by LEGER (1923), to *Hainan* by BERCOVITZ (1922) regarding the incidence of yaws, and to *Formosa* by OHO (1921).

Dutch East Indies.—(Pop. 45,000,000.) WINCKEL (1923) estimates the percentage infected with yaws at from 12–90 in different areas (55 per cent. of school children showing evidence of the disease). 1,000,000 persons received treatment in 4 years under the scheme there in operation. SALM (1923) in Java with 8 medical officers treated 2,565 cases in 3 months. VAN DRIEL (1922) referring to the incidence of syphilis states that it is common among the Chinese, but uncommon among the Bataks in Sumatra. In Java it is also widespread among the Malays. WAAR (1925) states that syphilis is rare, but that yaws is common in *Borneo.*

New Guinea.—JACKSON (1924) states that, although syphilis has been said to be common, it is in reality rare, adding that no case of primary sore, inherited disease or parasyphilis was seen among 15,000 persons examined ; cases of ulcer did not respond to antisyphilitic remedies. The non-observation of these particular manifestations does not, however, by any means prove that syphilis may not occur.

For *Samoa,* PARHAM (1922) says the incidence of yaws is high, and HURST and JOHNSTON (1923) saw 2,500 cases in 1921, but no syphilis.

SMITH (1923) refers to the low syphilis rate in the *Philippines*, while yaws is dealt with by GUTIERREZ (1923)(1923*a* & *b*) (1925) and NICOLAS (1924, MAUL (1918), SELLARDS and his colleagues (1923).

In the Annual Report for *New Hebrides* yaws is said to be widespread, but syphilis was never diagnosed. There are references to yaws by METCALFE (1924) for *Thursday Island*, where the disease is common, by MCKENZIE (1924) for *Cook Islands*, BARKER (1925) for *Nicobar*, but no mention of syphilis.

For *British Honduras* (pop. 46,527) the only figures given in the Annual Report refer to Belize Hospital in 1923, where about 50 cases of syphilis and one or two of yaws were seen. Using a modification of Noguchi's test, CLARK (1924) gives the following figures for employees on the United Fruit Company's estates in North Honduras, where yaws is rare :—

	No.	++ Per cent.	+ Per cent.
Negroes and mulattoes	200	26	9
Latin Americans	1,113	13·2	6·7
North American and European	104	9·6	12·5

NOC (1911) says of the *West Indies* that syphilis is more to be dreaded than malaria and yellow fever, but gives no definite figures. DICKSON (1921) refers to yaws in *Grenada*, GIDEON (1921) to *Jamaica*, where out of a total population of 66,000, 12,000 yaws cases were treated in 3 years by N.A.B. HANSCHELL (1923) refers to the fact that yaws which used to be common in *Barbadoes* is now rare. SELLARDS, GOODPASTURE and DE LEON (1923) have dealt with the question of yaws in *Santo Domingo* and MOSS and BIGELOW (1922) give an analysis of 1,046 cases. WILSON (1924) refers to 1,000 early and 4,000 late cases of yaws seen in 9 months in the Jacucal Province of *Haiti*, but it would seem possible that some of these were cases of syphilis, as this disease is stated by LEVY (1923) to be very widespread.

Brazil. GAVIÃO GONZAGA (1923) estimates the yaws incidence at 25–80 per cent. in various provinces, while DUREN and LAJEUNE (1923) state that syphilis is very prevalent throughout town and country.

Buenaventura BURGA (1920) refers to yaws in *Peru.*

In the *Panama Canal Zone* Report for 1922, the admission rate for venereal diseases for 1921 is given at 21·54 and for 1922 at 18·28.

LEVY (1923) has pointed out that syphilis is rife among the negroes in *Texas*, and common, indeed, among negro populations in other States of *America.* Cases of yaws reported from countries outside tropical zones would appear to be all imported cases. Such a case is reported by CADY and ENGMAN (1924) from *Missouri* with pathological findings, upon which the diagnosis rests, perhaps a little doubtfully. FOX (1922) reviews 51 similar cases. ALDERSON (1923) reported a case in *California* in a Filipino fireman who contracted the disease from a ship's cook ; STEPHENSON (1920), a case on board a ship at Brest in a man coming from *Haiti.* Recently, FALLAS and BÜLOW (1925) have met with a few cases in *Costa Rica* which they believe to be yaws, the first to be described from that country ; from the clinical description given it is at least a little doubtful if these will prove to be cases of that disease.

Yaws.

Nomenclature.—The term Yaws has been adopted in the *Bulletin* on account of brevity and because historically it is the old name by which the disease has been known to English-speaking peoples. A monograph on this disease appeared recently under the title Parangi, and in the Ceylon Government Medical Reports the same local synonym is used—a practice which has nothing to recommend it. Up to the present time no definition other than one depending upon the essential framboesial eruption has been suggested.

Etiology.—There are but few researches to chronicle upon the *Treponema pertenue,* an organism which is, according to authorities, morphologically indistinguishable from *T. pallidum.* The results of dark ground illumination for Treponemata, their rate of disappearance under treatment and the histopathological findings in a case discovered in Missouri are given by Cady and Engman (1924). Similar observations are described by Knowles and co-workers (1923). Sellards, (1923) using Levaditi's method, found the treponemas in abundance in early yaws, not only in the thickened epithelium, but in the perivascular connective tissue of the papillae. These all disappeared within 40 hours of a dose of neosalvarsan.

Pearce and Brown (1925), carrying on a long series of experiments by intratesticular inoculations of yaws virus into rabbits on the lines of similar experiments done in relation to the virus of syphilis, have demonstrated what they consider to be a characteristic tissue reaction differentiating yaws from the latter disease, namely, peculiar granular periorchitis with little oedema of scrotum and tunica, as in pallidum infections, and slight changes only in the testicle in no way comparable with syphilitic lesions, with little or no perivascular round cell infiltration. Only transient enlargement of inguinal glands occurred, with no enlargement of the popliteal nodes so characteristic of the other disease and no other signs of generalized lesions were found, such as occur in rabbits similarly inoculated with syphilitic virus.

Yaws remains, in distinction from syphilis which is found most widespread among town dwellers, a disease of native villages in areas far removed from civilization. Lack of clothing and liability to skin abrasions are cited by most observers as important factors predisposing to infection, as also are lack of segregation of the sick and many native customs. Powell's observations in Assam are among the most interesting when he had the opportunity of watching the introduction of yaws into India. The first two cases arrived in Assam in 1899, and in the subsequent 10 years he saw the disease claim 653 victims among 6,000 coolies employed in an area 222 by 4 miles in extent. In each case the site of the primary lesion was noted, these corresponding in the majority of cases with some previous skin abrasion, among them, ankylostome vesicles on the feet. Henggeler (1904) mentions leech bites in the same connexion, Gutierrez scabies, and others vaccination wounds. Gonzaga, in Ceara, Brazil, believes that Culicoides act as agents in transmission. Hurst and Johnson point out that yaws becomes epidemic in American Samoa following the season when flies are most numerous owing to the rotting bread fruit. In a recent discussion Austen (1923) pointed out the desirability of identifying the flies which feed on yaws sores and are believed to carry infection. The effect of climate as a factor in the etiology of the disease has been noticed in the past, and is referred to by Gilks

(1922), who states that though found at both sea level and at an altitude of 5,000 ft., the disease would appear to be more prevalent among the inhabitants of lower-lying areas. CANTLIE reports finding cases common in the mountainous regions of Mongalla, and OHO at 5,000 ft. in Formosa. WINCKEL found that it was chiefly a disease of the low country in Java, but in Sumatra it is widespread on the Batak plateau at over 3,000 ft. SELLARDS, working in the Philippines, made the interesting observation that, in N. Luzon Province, at 2,500–5,000 ft., the lesions of yaws were largely limited to the regions about the mouth, anus and vulva, pointing to anatomical peculiarity or clothing as factors.

Very great interest attaches to the more recent observations by RAMSAY in Assam. He found that florid yaws was only common among the plain dwellers in the warm season ; in the cold season these people and the hill people at all seasons showed only condyloma-like lesions in the warm moist regions of the axilla, between the nates, etc., while with the return of the hot weather, or if the hill dweller came down to the hot plain, the disease again became florid. This observation may explain why yaws has been missed sometimes in what are endemic areas ; it is a point of interest and illustrates the fact that in searching for disease among native populations it is necessary to know where to look and what to look for.

Many observers refer to the heavy incidence in childhood ; thus SELLARDS found 69 per cent. of his cases were under the age of 11 years. Generally speaking, the greater the incidence of yaws in any given population of natives, the greater is the proportion of child infections, so that in communities where 100 per cent. are infected the disease might almost be looked upon as one of the exanthemata of childhood. I believe that the same may be true of syphilis in some countries.

Pathology.—CADY and ENGMAN, quoted above, and KNOWLES give some account of pathological findings, and MAUL (*vide infra*) has described the radiographic appearances in tertiary bony lesions. Other references are contained in the writings of GUERRERO and SELLARDS, but with these few exceptions there appears to have been no work recorded on the pathological side. The pathogeny and pathology of yaws are subjects deserving of reinvestigation and careful comparison with the findings in cases of syphilis among the same peoples.

Symptomatology and Clinical Manifestations.—Among the clinical accounts of the disease those by POWELL in Assam, on account of their precision, are particularly valuable, and what appear to be his just criticisms of much that has been written on yaws by others, including the careless use of descriptive terms, should be read by everyone interested in the subject who would preserve a critical mind towards a disease which still presents many unsolved problems. POWELL gives at the same time a good bibliography of earlier authors. He lays stress upon the following points : The initial lesions, if they be seen, and the subsequent generalized eruptions never have the form of ulcers as described in many textbooks ; glandular enlargement is not noticeable in any cases unless complicated by sepsis or recent syphilis ; prodromal furfuraceous eruptions do not occur ; fever, as a symptom, is absent in children and occurs in adults more rarely than some writers state ; affections of mucous membranes do not occur ; no tertiary lesions were observed in the 10½ years his cases

were watched. Hyperkeratosis, this author states, is commoner in other parts of India where there is no yaws than among his cases and he has seen persons with this condition develop primary yaws. Gangosa he believes to be a syphilitic manifestation. No case of inherited transmission was seen.

RAMSAY, writing recently from Assam, found " chronic dermatitis " and " the worm-eaten appearance on the soles of the feet " common among his 1,000 cases, but " tertiary lesions " uncommon, arthritis occurred in 30 per cent., chiefly of phalanges. GUTIERREZ states that 50 per cent. of cases attending a yaws clinic in the Philippines had keratosis. DYE (1924) only saw one case of " pitted palms " among some hundreds of cases in N. Nyasaland, though the condition is common enough elsewhere in that country. SELLARDS describes clavus as common in Santo Domingo, but rare in Manila. With regard to lesions of mucous membranes (never noted by POWELL and other good observers), it may be recalled that CASTELLANI states they " are not very common," and adds that granulomatous nodules may develop at the base of the tongue and on the nasal mucous membrane, and more rarely in the larynx. ESLER (1925), in Kenya, quotes the case of a child aged 2 years with florid secondary yaws who developed laryngeal obstruction necessitating tracheotomy, and CALLANAN has seen a single case among many thousands showing a lesion on the tongue. HURST and JOHNSON, among 2,000 cases in Samoa, found less than 5 per mille with any lesions on mucosa, and in those cases the nasal mucous membrane was alone affected. NOEL, writing from Cameroon, asks one to believe that he saw among 97 cases of yaws, 22 with the mouth, 19 with the nose, and 4 with the conjunctiva affected. In many of the cases reported there is a strong suspicion that it is the muco-cutaneous junction area which is involved, and not the mucosa. SPITTEL, in his monograph on yaws in Ceylon, states that he has never seen any lesion of a mucous membrane. He says, too, that he has never seen alopecia ; hyperkeratosis is not mentioned, but he admits the acuminate papular rash with furfuraceous desquamation, the pitting on the palms and worm-eaten appearance of the soles of the feet.

MOSS and BIGELOW found the primary lesion on the lower extremity below the knee in 705 out of 803 cases, and infer that trauma is an important factor, and that flies play little part. The primary yaw occurred on the genitalia in only 1 per cent. They believe that the soles of the feet are always the seat of granulomata, and later clavus : only in a single patient was a lesion of mucous membrane noted. They state that it was impossible to make a differential diagnosis from syphilis in tertiary cases, but do not state definitely whether they saw natives suffering from unquestionable syphilis. PIETER (1922) criticizes and supplements these writers. Fever he finds a constant symptom in the secondary stage, and states that it is influenced by quinine (!). CALLANAN (1925), in Kenya, through whose hands some 12,000 cases of yaws have passed in 27 months, has in a recent thesis set down many important observations. Among 415 cases in which the site of the primary yaw was determined, it was on the lower extremity in 68 per cent., trunk 10 per cent., nipple 8·6 per cent., upper extremity 9·1 per cent., head 3·3 per cent. In 25 per cent. of cases in which both mother and child were affected the infection was from mother to child, and in 75 per cent. from child to mother, the lesion being on the nipple. The secondary eruption was commonly

heralded by vague pains in the limbs and headache ; glandular enlargement occurred later in the following proportion—inguinal 64·1 per cent., epitrochlear 35·2 per cent., posterior cervical 8·2 per cent. ; synovitis of knee and elbow was not uncommon.

The secondary eruption showed a predilection for moist surfaces ; papular and scaly framboesides were occasionally seen, but furfuraceous desquamation was very rare.

Tertiary lesions noted included gummata, periostitis and osteitis as usually described ; pseudomycetoma, juxta-articular nodules and goundou, of which there were but few cases, are believed to be due to yaws, as well as gangosa which was very common. The following table sums up his findings in percentages :—

	Adult.		*Children.*	
	Male.	*Female.*	*Male.*	*Female.*
1. Primary	2·8	5·7	11·9	14·0
2. Secondary	8·1	5·0	10·0	11·8
1 and 2	11·5	13·7	45·1	51·6
3. Tertiary	71·1	70·0	32·1	21·6
4. Gangosa	4·3	3·6	0·9	—
3 and 4	2·2	2·0	—	1·0

GUTIERREZ, in Manila, besides papules and nodules in the secondary stage, describes macular lesions and " ichthyosis-like shins." In contradistinction to POWELL, SPITTEL maintains that the time has arrived for speaking authoritatively upon the occurrence of tertiary lesions in yaws and accepts all those usually described under tertiary yaws, together with gangosa, juxta-articular nodules, and the leucoderma described by ZIEMANN under the term " Melung." The following statements, however, by SPITTEL have no very authoritative ring about them—the italics are the reviewer's—" organs such as the liver, testicles and kidneys, the nervous system, brain and spinal cord, and the walls of the blood vessels *do not seem to be affected with anything like the same frequency as in syphilis* : indeed, evidence is strong that these structures either altogether escape, or are but transiently affected . . . *it is highly probable that the nervous system is slightly touched at one stage* of Parangi. The disease bears too close a resemblance to syphilis for this not to be so." It is noticeable that there has always been too great a tendency to describe yaws in terms of syphilis. A case is described from Kenya in which there was absorption of the phalanges, so that some of the fingers were merely represented by some button-like bodies, with the suggested diagnosis of " Paraframboesia," a suggestion and a term hardly warranted. There has been no evidence of value produced in recent writings to show that the nervous system is ever affected in yaws. The effect of any febrile disturbance such as malaria in causing retrogression of the secondary framboesial eruption was noted by POWELL, and is referred to by ONG KIE HONG (1924). RAMSAY has seized upon this fact to explain his finding of tertiary lesions more common among the hill people than among the plain dwellers by saying that malaria plays a part in preventing the development of the later manifestations in the latter.

PARHAM believes the Samoans and Fijians, who are 100 per cent. infected with yaws, to be immune to syphilis in consequence. He is incredulous of double infections, and considers, with HARPER (1925), that general paralysis and tabes may result from yaws and quotes BUTLER in the belief that yaws may be inherited, an attitude which

to most observers must appear untenable. POWELL refers with much scepticism to the statement that there is no syphilis among the Fijians and mentions that for 26 years there were 25,000 Assamese coolies in Fiji, and he is unable to believe that they were free from syphilis. He also mentions that 30 years ago the missionaries were deploring the spread of syphilis, and states that most of the photographs of "tertiary yaws" cases from Fiji have been of Indian coolies. In a recent paper HARPER is at pains to further insist that only yaws to the exclusion of syphilis occurs among Fijians, and then goes on to state that there is evidence that yaws is a cause of miscarriage, that among the late manifestations of that disease are "sabre-tibia," gummatous ulceration of skin, nasal septum and palate, irido-cyclitis, transverse myelitis and of paraframboesia aortic aneurysm and optic atrophy are commonest, while tabes and G.P.I. also occur, statements which are not likely to meet ready acceptance in view of the fact that syphilis is rife among the Indian women to whom the Fijians have access.

MAUL, in the Philippines, by X-ray examination finds 20 per cent. of yaws cases exhibit bone and joint lesions, commonly a rarefying osteitis affecting the inner parts of the bones, sometimes the outer surfaces, later with marked deformity of bone outline, and growth may be interfered with when at joint surfaces there is pressure or liability to trauma. The condition differs from syphilis in that there is no periosteal proliferation and no thickening of the cortex of the bone. In 80 per cent. the shaft is affected, in 20 per cent. the epiphysis or articular surface, in 75 per cent. the lesions are multiple. The bones in order of frequence with which they show changes are: Tibia, tarsus, fibula, phalanges, metatarsus, radius, patella, humerus, femur, ulna. Under treatment these lesions clear up if of not too long standing, but they take longer than the clinical manifestations. These observations are of great value in view of the fact that these conditions are so commonly described under the term "periostitis." SOETOMO and EICHHORN (1925) have also described bone atrophy, as shown by X-rays, as characteristic of yaws in contradistinction to syphilis. CLAPIER, on the Ubanghi river, describes osteitis of short bones—scapula, trapezium, scaphoid, of the epiphysis of long bones, tibia, humerus and ulnar, but of the diaphysis of the phalanges. EGYEDI (1925) contributes an interesting paper on framboesial lesions in joints, tendon, sheaths and bursae among natives of Nias, where yaws is common and syphilis unknown.

VAN NITSEN, in the region between Lakes Tanganyika and Mwera, where syphilis is stated to be rare, examined 700 cases of yaws and found "tertiary" lesions in the majority, either appearing at the end of the secondary stage or from 10-25 years later. There were 178 cases of arthalgia, 74 arthritis, 72 ostealgia, 77 periostitis, 27 necrosis, 2 bone rarefication. 500 cases also presented ulcerative lesions. HUNT and JOHNSON state that 20 per cent. of their 2,000 cases of yaws in American Samoa, where syphilis is said to be absent, had periostitis. Snuffles they found to be common among the children in the secondary stage, and painful joints resembling those of rheumatic fever were often complained of, but relieved by potassium iodide. Parenchymatous keratitis is also recorded(!). WINCKEL presents a large array of facts in support of his belief that tertiary lesions are common He cites BRUG as recording in 1911 cases of tertiary syphilis to the number of 532 in Sumatra, and only 2 of primary and secondary

disease, but states that the former *were shown to be yaws*, and goes on to say that in Sumba island KUYER, in 1922, found syphilis to be practically non-existent, but 70 per cent. of this population had had yaws and many suffered from *peritonitis*, arthritis, and *gummata of various organs, besides* pseudo-leprosy, a statement which leaves one in wonder whether BRUG was not after all correct. DYE, among some hundreds of cases of yaws in Nyasaland, mentions only dactylitis as common among bony lesions. PENRIS (1924) points out how commonly tertiary yaws and tertiary syphilis are confounded. GUTIERREZ, at Paranaque, Philippines, studied 229 cases of yaws, with tertiary lesions present in a third of their number—periostitis, gummata, keratosis; he believes that keratosis, pitting, melung, juxta-articular nodules and gangosa are all framboesial. WILSON alludes to yaws being a disease of shame in Haiti, and to the consequent difficulty in getting in touch with secondary cases. The commonest tertiary lesions seen resembled ulcerating tubercular syphilides, then periostitis and osteitis of the bones of the leg and gangosa—other bones attacked were clavicle, scapula, radius, ulna, and the bones of the hands and feet, while the humerus, femur, ribs and vertebrae escape. In the absence of other evidence there appears no proof that many of the cases were not syphilitic, syphilis being, it is stated, widespread.

Diagnosis of yaws; differential diagnosis from syphilis.—Practically all observers appear to agree that there is no difficulty in making a diagnosis in a typical case of yaws in the secondary stage. The framboesial lesion is without counterpart in syphilis or any other disease. FOX and OCHS (1922), under the title "Framboesiform Syphilide (?)," have described a case which on internal evidence would appear to have been a case of yaws. GOODMAN and TRAUB (1923) have also referred to a framboesiform syphilide, but it is doubtful whether it would be mistaken for yaws. The difficulty in diagnosis arises later, between what are considered to be tertiary manifestations of this disease and similar conditions which may be due to syphilis. There are some who maintain that yaws and syphilis are one and the same disease. BORY (1924) looks upon yaws as primitive syphilis, a disease which has remained dermotropic in its manifestations under primitive conditions among native races in tropical countries, but which since the era of civilization developed among Europeans into syphilis as we know it, the virus becoming neurotropic. MÜLLER (1923) appears to suggest the same idea. He finds that the spironema of yaws is located in the epidermis, of syphilis in the dermis, that mucosae are affected in syphilis, but spared in yaws, that congenital transmission occurs in syphilis, not in yaws. In cold climates, instead of the virus being shed by the skin, it becomes mainly restricted to mucous membranes, and to compensate for this handicap, the spironema becomes able to attack the ovum. These are interesting speculations, but the fact that a syphilitic may be infected with yaws and *vice versa* is held sufficient by the majority to substantiate two disease entities.

POWELL holds that the history of the introduction of yaws into India, where syphilis had existed for centuries, is sufficient to prove the two diseases distinct, and he gives examples of superimposed infections. MACKENZIE records recently the case of a Polynesian who developed a hard chancre with shotty inguinal glands, etc., while suffering from a recrudescence of yaws. Franz JAHNEL and Johannes

LANGE (1925), in Munich, recently tried to infect general paralytics with yaws and syphilis with negative results, their yaws virus being active, as shown by the successful inoculation of a non-syphilitic. Examination of the juices expressed from the lesions in the two diseases yields no definite conclusions ; treponemata are generally more numerous in framboesial than syphilitic lesions, but they cannot be distinguished morphologically the one from the other. The technique for examination is mentioned by KNOWLES and his co-workers. Under treatment by arsenicals the organisms are said to disappear more rapidly in yaws, within 40 hours of the first injection according to SELLARDS and GOODPASTURE.

Serum reactions.—Wassermann and Sach-Georgi tests give no help in differential diagnosis. GOODPASTURE and DE LEON obtained 100 per cent. strongly positive reactions in 45 cases of florid yaws using Wassermann technique. MOSS and BIGELOW found 78 positive out of 91 cases of yaws, the negative results occurring in late secondary, tertiary and latent stages of the disease. VAN NITSEN finds that the reaction becomes positive earlier in yaws than in syphilis, and alludes to cases with persistent positive reactions just as are seen in syphilis. Other workers whose results have recently been published include VAN DEN BRANDEN and VAN HOOF, PENRIS, CADY and ENGMAN.

Most observers will agree with NICOLAS that a detailed clinical history is of the greatest value in the diagnosis of yaws, and this should be taken in conjunction with the clinical picture as recommended by SPITTEL, but all will not agree with the differential diagnosis given by that author. Co-existing infections with syphilis and yaws present a further difficulty, and while it is commonly known that yaws is often a disease of childhood, in some areas affecting 100 per cent. of children, the fact that child infections with syphilis may also be very common is often lost sight of.

Treatment.—The subject of treatment may be considered from two aspects—the treatment of the individual case and treatment as it may be adopted in an anti-yaws campaign when consideration has to be given to the factors imposed by local conditions, number of individuals affected, their age, sex and distribution, their mode of life, customs, the nature of their local government and, lastly, the staff, transport and funds available.

The treatment of the individual resolves itself into treatment by drugs. With the exception of PIETER, who finds mercurial inunctions useful in Dominica, following the native popular remedy of Van Swieten's liquor (mercuric chloride), all other workers in this field have discarded mercury, and, indeed, resistance to mercurial treatment is mentioned as a point in differential diagnosis by many authorities, leading one to suspect that they are syphilitic manifestations which are relieved in Dominica. Following the history of the treatment of syphilis, potassium iodide was, until recent years, the most valuable remedy either alone or in a combination such as Castellani's mixture. That the dosage was not however, sufficiently large probably accounts for many of the unsatisfactory results.

DYE found drachm doses for adults and 20 grains for children thrice daily for 3 weeks in secondary and 8 weeks in tertiary cases yielded satisfactory results. VAN NITSEN records similar experiences. Since the introduction of salvarsan and its derivatives, iodides have been, however, little used except in tertiary cases which, many of them at least, may be really syphilitic. The employment of antimony

compounds appears hardly worthy of consideration now. VAN NITSEN found tartar emetic uncertain in action, and BEURNIER and CLAPIER do not favour its employment. DYE, AUDEN (1922) and REID also report on its use. The introduction of salvarsan and its derivatives following its use in syphilis revolutionized the treatment of yaws, and all authors refer to the dramatically rapid disappearance of secondary lesions under treatment with these preparations. Neosalvarsan and N.A.B. yield the best results and galyl the worst, the last-mentioned being often followed by relapse. The reported results of treatment often leave much to be desired ; the word " cure " is too often used when only a disappearance of the secondary framboesial eruption has been effected. Many cases become latent, and there is little evidence yet as to what should really constitute an average course of treatment in the various groups of cases that have to be dealt with.

SPITTEL recommends six weekly injections of neosalvarsan in doses of 0·6 to 0·75 gm., but states that he has seen many recurrences. PIETER has observed numerous relapses 2–4 months after a total of 4·5 gm. N.A.B. GUTIERREZ, on the other hand, found that 94·5 per cent. of his patients remained well 1½ months after a single ·6 gm. dose of neoarsphenamin. CLAPIER reports, without details, 25 per cent. cures after one and 50 per cent. cures after two injections of N.A.B. 1-1·5 cgm. per kilo body weight. HENDRIKS (1924) in 2 years treated 3,875 cases with 4,133 injections, and reports 85 per cent. " recoveries." VAN DEN BRANDEN and VAN HOOF find sulpharsenol equal in effect to neosalvarsan or novarsenobillon. TOURNIER (1922), using arsenobenzol dissolved in " serum " (normal saline) injected deep subcutaneously obtained cures in 18 per cent. after one, and in 60 per cent. after two doses. HUNT and JOHNSON advise 3 injections intravenously at weekly intervals of 0·9 gm. arsphenamin or the neo compound. GOONAWARDENA (1923) recommends the use of pot. iod. after three injections of salvarsan, but he says he has seen many a case relapse after 10 injections. KNOWLES and his colleagues use sulpharsenol and silver salvarsan, giving 1-3 injections. DYE reports no relapse in the 12 months subsequent to treatment by N.A.B.—two doses of 0·3 and 0·6 gm. at a week's interval.

In those countries in which anti-yaws campaigns have been launched it is freely admitted that an attempt is being made rather to diminish the number of actively contagious cases than to effect an absolute cure of the disease. Thus, in the Dutch East Indies, one or more rarely two treatments with salvarsan or neosalvarsan have been relied on ; the same is true of Kenya, Haiti, Grenada, etc. What the ultimate result may be is uncertain. It is just possible that a vast number of cases with latent infections may be created with an increase in the number who later show tertiary manifestations. What is required at the present time is an investigation, on a large scale, carried on through a number of years, with detailed observations, as to the most efficacious forms of treatment to effect cure—these observations to be rigidly controlled by laboratory tests something after the nature of Vernes syphilimetric method (*q.v.*). Until this has been accomplished the treatment of yaws will not have been established on a sound basis.

The use of bismuth in conjunction with arsenicals in the treatment of syphilis in France and in this country has gained firm adherents. Very encouraging results have been obtained with this metal or its

salts apart from salvarsan derivatives in yaws. On account of its cheapness its use has superseded that of salvarsan compounds in the campaign being conducted in Kenya Colony as described by GILKS. There and in Tanganyika Territory, as reported by DAVEY, ILES, MCNAUGHTON and others, potassium sodium bismuth tartrate is being used. There still seems to be some difficulty in obtaining this compound with a constant bismuth content, which may account in part for a number of fatalities reported from the latter country. WARREN (---) has referred to this point. Other references to the use of bismuth tartrate of potassium are made by GUERRERO and FERNANDEZ (1923), DANET and BEURNIS (1924) and VAN DEN BRANDEN; of Trepol by VAN DEN BRANDEN and VAN HOOF ; of bismuth salicylate by PALMER (1924) ; of bischloral by MATTLET ; of dermatol by MIGUENS and MATTLET. All observers appear to have obtained good immediate results with bismuth salts in the treatment of yaws, but the observations made above in reference to the arsenic compounds are even more true of bismuth. It is quite possible that the best form in which to administer bismuth has not yet been discovered, and it is more than probable that the potassium sodium bismuth tartrate which is at present being so widely used in Kenya will be found not to be the most satisfactory preparation. Bisoxyl has been well reported on in this country in the treatment of syphilis, used, of course, in alternate courses with a salvarsan derivative ; this and bismuth hydroxide, as suggested by LOMHOLT (1925), might prove the most satisfactory in yaws.

BEURNIER and CLAPIER (1924) report favourably on the results obtained with " 189," but it appears to possess no advantage over N.A.B. The latest drug to be tried in yaws is stovarsol, or " 190," which has the enormous advantage that it is given by mouth. Its use is very favourably reported upon by BEURNIER and CLAPIER, BAERMANN (1923), LEGER (1925), TANON and JAMOT (1924). The dosage tried by ROUVROY (1925) was 0·75 gm. on the first and second days, on the third, fourth and fifth days 1·0 gm., followed by six days of 0·5 gm. All manifestations disappeared. BOUFFARD (1925) also had satisfactory results in children on the Ivory Coast. Treparsol, which has been tried in syphilis and is also given in tabloid form by mouth, might be useful in yaws.

SELLARDS, GOODPASTURE and DE LEON repeated the experimental treatment of cases with the serum of patients who had received injections of N.A.B., but obtained disappointing results in no way confirming those described by ALSTON.

FISHER (1923) recently has reported satisfactory results in 84 cases of yaws treated in the Belgian Congo with Novasurol—four intragluteal injections at 5-6 day intervals of a 10 per cent. solution using 1·2 cc. for children and 2·2 cc. for adults.

(*To be concluded.*)

YAWS AND SYPHILIS.

FALLAS (S.) & VON BÜLOW (T.). Le pian au Costa-Rica. [**Yaws in Costa Rica.**]—*Bull. Soc. Path. Exot.* 1925. June 10. Vol. 18. No. 6. pp. 450–453. With 1 text fig.

At the antivenereal clinic of Puntarenas the authors, during the past year, saw four patients from the south-west coastal region adjoining Panama with symptoms which they diagnosed as yaws, and from observations made by one of them some four years ago they believe the disease to be endemic in that area, and state that this is the first occasion on which the endemicity of yaws has been established, though they add that the native has distinguished the disease from syphilis under the name of "bouba." The clinical account of but a single case is given, the authors observing that the eruption differs somewhat from that usually described, they themselves apparently not being familiar with the disease as met with elsewhere.

The case mentioned is stated to have had four months previously a generalized vesicular eruption, most marked on exposed surfaces and in the neighbourhood of the natural orifices: after eight days the vesicles burst and gave forth a fetid odour. Proliferation of granulation tissue then occurred and the lesions became covered with yellow crusts which rapidly turned brown. These lesions bled easily on touch, and there was a tendency to spontaneous healing. Fresh eruptions continued to appear for a year. The patient acknowledged having had fever only during the last four months, and otherwise complained only of pain about the joints and rigidity in the lower limbs. The state of the teeth was noted to be very bad, and there was enlargement of spleen and liver. No venereal history, but the Bordet-Wassermann reaction was strongly positive. Blood examination was negative for parasites; red cells 2,196,000; white cells 11,000 with approximately normal differential count. Urine: alkaline and bacilluria present. Faeces: *Necator americanus* present. Microscopical examination of scrapings from the skin lesions stained with Borrel's Blue showed only a few intracellular diplococci. The cutaneous manifestations disappeared after 2 or 3 injections of N.A.B.

[The reader of this article, which has been quoted fully above, will hesitate to subscribe to the authors' claim to have described cases of yaws in Costa Rica.]

H. S. Stannus.

HENDRIKS (J. A.). Framboesia tropica. [**Yaws.**]—*Herinnerings-bundel Inst. v. Trop. Geneesk. Leiden.* 1924. pp. 46–57.

A description of the clinical symptoms of yaws as it occurs in the district of Padang Sidempuan (Residency of Tapanuli, Sumatra), especially among the Batak-population in the low-lying departments (under 200 m.) of Padang Lawas and Natal. The treatment adopted was by intravenous injections of neosalvarsan, in a 5 per cent. solution, the dose gradually decreasing from 11 to 3 cc. In 2 years, 3,875 patients were treated with 4,133 injections, and 85 per cent. made a satisfactory recovery.

N. H. Swellengrebel.

EGYEDI (Henrik). **Changes in Joints, Tendon-Sheaths and Bursae due to Framboesia.**—*Meded. Dienst. d. Volksgezondheid in Nederl.-Indië.* 1925. Pt. 2. pp. 175–182. With 8 figs. on 2 plates.

Working in the island of Nias to the west of Sumatra, an island administered by the Dutch during the past 35 years only, and which has remained isolated without intercourse with surrounding peoples and in which the inhabitants observe a very strict moral code, the author believes that syphilis does not exist, while on the other hand 80 per cent. of the population are suffering or have suffered from yaws. In one year, among 5,000 natives treated, no cases of gonorrhoea, bubo or chancroid was seen.

As tertiary manifestations of yaws the writer distinguishes lesions in the sites mentioned in the title of his paper, and believes those which develop in bursae to be the origin of juxta-articular nodules. In tendon sheaths somewhat similar nodes are formed, while in joints he believes that yaws may give rise to a proliferative synovitis or to ankylosis. In all there tends to follow a secondary muscular wasting due to pain and disuse. The nodes tend to caseate and to become calcified; some break down and discharge their caseous contents. Treatment with salvarsan was effective in causing the disappearance of the earlier affections and diminution in size and pain in those of longer standing, while little result was obtained in caseated and calcified lesions.

H. S. S.

GUTIERREZ (P. D.). **Late or Tertiary Manifestations of Yaws.**—*Arch. Dermat. & Syph.* 1925. Oct. Vol. 12. No. 4. pp. 465–482. With 12 text figs. [50 refs.]

The purpose of this paper, the author says, is "to describe the more common tertiary lesions encountered," as "little information is gained regarding the tertiary lesions of yaws from studying text-books." This latter statement is unfortunately true; on the other hand, the conditions which Gutierrez describes are all well-known to those acquainted with yaws. The value of the article lies in the fact that it deals with the disease as seen in Philippine Islands, and gives a picture which can be compared with the manifestations of yaws elsewhere in the world, as opinions differ as to what are and what are not the tertiary lesions of yaws.

A careful study of 229 cases at Parañaque yielded the following figures:—

				Incidence of Tertiary Manifestations			
1. Primary ...	10 or	4·36	per cent.	a. Periostitis	7 or	30·43	per cent.
2. Secondary	90 ,,	39·30	,,	b. Gummas ...	3 ,,	13·04	,,
3. Tertiary ...	24 ,,	10·48	,,	c. Keratoderma	10 ,,	43·47	,,
Combined				Combined			
1 & 2 ...	52 ,,	22·70	,,	a & b ...	2 ,,	8·69	,,
2 & 3 ...	39 ,,	17·03	,,	a & c ...	1 ,,	4·34	,,
1, 2 & 3...	14 ,,	6·11	,,				
	229				23		

These figures deal with cases under treatment only and are misleading in regard to keratoderma which, it is pointed out, is a very common late manifestation in those who have had yaws. In Catanduanes out of 973 cases of yaws nearly 74 per cent. exhibited this condition. The same is true of gangosa and juxta-articular nodes, both conditions

considered to be due to yaws; they are not included in these figures, but 20 cases of the former and 40 of the latter were collected. The tertiary lesions described are nodes and gummata of skin and bone, the diffuse osteitis of the latter and synovitis. Keratoderma is dealt with at some length with, however, some confusion in regard to nomenclature. Reference is made to MOSS and BIGELOW, who "describe clavus-like thickening of the soles, which the natives of Santo Domingo call 'clavus,' because of the sensation it produces of walking on nails," in the second phrase surely according a wrong etiology to the word clavus. Again, he ascribes to CASTELLANI and CHALMERS the introduction of the word "melung" to describe the late stage of the "peculiar pitting of the hands" which occurs in yaws. As has been pointed out on a previous occasion, the word melung was used first by ZIEMANN to describe pigmentary changes in the skin of the hands and feet which he considered to be a form of localized leucoderma, and only later was it recognized as probably due to yaws and noted to be associated with keratoderma; this being so this word would be better forgotten. The descriptions given of the conditions actually seen are for the most part excellent and the photographs perfect.

H. S. S.

i. HEERDJAN. Een bijzondere vorm van Framboesia III. [**A Peculiar Form of Tertiary Yaws.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1925. Vol. 65. No. 2. pp. 202–206. With 4 figs. on 1 plate.

ii. SOETOMO (R.) & EICHHORN. Een vorm van tertiaire framboesia bij kinderen. [**A Form of Tertiary Yaws in Children.**]—*Ibid.* pp. 207–211. With 9 figs. on 4 plates.

i. Two Javanese men, 45 and 47 years of age, who suffered from yaws in childhood, showed patches of diffuse, itching hyperkeratosis in various places (hands, feet, knees). There was hyperpigmentation in the centre of the patches and depigmentation near their well-marked margins. Specific treatment (bismutho-yatren, neosalvarsan) brought about considerable improvement. The differential diagnosis had to be made from psoriasis, psoriasis luetica, dermatomycosis, eczema keratoides, traumatic and arsenical hyperkeratosis.

ii. Soetomo's patient, a Javanese boy of 8 years, suffering from tertiary framboesia, showed typical sword-shaped tibiae, which affection the author has always considered as a symptom of tertiary syphilis. [This condition has, of course, been frequently described before as a manifestation of tertiary yaws..—H. S. S.] EICHHORN dealt with the X-ray differential diagnosis of framboetic and syphilitic bone lesions. He lays stress upon the bone atrophy, which is common in yaws, rare in syphilis.

W. J. Bais.

JAHNEL (Franz) & LANGE (Johannes). Ein Beitrag zu den Beziehungen zwischen Framboesie und Syphilis: die Framboesieimmunität von Paralytikern. [**The Relations between Yaws and Syphilis; Yaws Immunity in General Paralysis.**]—*Muench. Med. Woch.* 1925. Aug. 28. Vol. 72. No. 35. pp. 1452–1453. [7 refs.]

After referring to various opinions regarding the relationship between yaws and syphilis, the authors relate their results in attempting to inoculate general paralytics with syphilis and yaws. The yaws virus

was contained in a rabbit submitted to intratesticular inoculation from a child suffering from yaws in Panama. In none of their experiments did they observe a positive result, but with the yaws virus they succeeded in inoculating a non-syphilitic control man with the disease. No very definite conclusions, however, can be drawn from these few experiments.

H. S. S.

FRAGA (A.). [**Transmission of Bouba to Animals.**]—*Annaes Brasil. de Derm. e. Syph.*, Rio de Janeiro. 1925. Jan. Vol. 1. p. 32. [Summarized in *Jl. Amer. Med. Assoc.* 1925. Sept. 19. Vol. 85. No. 12. p. 934.]

Dogs, rabbits and monkeys were inoculated with *Spirochaeta pertenuis* derived from 5 human cases of yaws; one of the two monkeys and some of the rabbits developed the disease, spirochaetes being abundant in the local lesion. No generalization was noted at the time of publishing the note. [No other details given.]

H. S. S.

BELL (P.). **Yaws (Framboesia) in the Chin Hills.** *Indian Med. Gaz.* 1925. June. Vol. 60. No. 6. pp. 259–261.

A rather disjointed account by Assistant Surgeon Bell of a number of cases of a disease which would appear to be yaws observed among the Chins near Falam.

H. S. S.

ESLER (A. R.). **Laryngeal Obstruction in Yaws.** [Correspondence.]—*Kenya Med. Jl.* 1925. June. Vol. 2. No. 3. p. 90.

Dr. Esler mentions the case of another child with a yaws eruption having signs of laryngeal obstruction (see this *Bulletin*, Vol. 22, p. 549). The child, however, disappeared without further investigation or treatment.

H. S. S.

PEARCE (Louise) & BROWN (Wade H.). **Distinctive Characteristics of Infections produced by *Treponema pertenue* in the Rabbit.**—*Jl. Experim. Med.* 1925. May 1. Vol. 41. No. 5. pp. 673–690. With 1 plate. [7 refs.]

After referring to the general consensus of opinion that while no absolute differentiation can be made upon morphological grounds between *Treponema pertenue* and *Treponema pallidum*, clinicians are practically unanimous in the view that yaws is not an attenuated or otherwise peculiar type of syphilis, but a separate clinical entity with a distinct symptom complex, the authors allude to the work of other investigators and point out that infection of experimental animals with the former organism has yielded little information to clarify the situation, since it has been thought that the lesions so closely resembled those which might be produced by *Treponema pallidum*.

The authors, during 4 years, have studied the lesions produced by intra-testicular injections of saline emulsions in rabbits only, containing two strains of *Treponema pertenue* obtained (1) from a rabbit inoculated in the testicles with material from the first rabbit passage from a black child of Panama suffering from typical yaws, (2) directly from a West Indian negress; this strain has been carried for 21 generations.

The results of these investigations go to show that the changes in the testicle are minimal, but that a characteristic periorchitis occurs consisting in the formation of small granulations about the third week. No oedema of scrotum and tunica occurred like that seen in *pallidum* infections. Microscopic changes are only referred to in a note, but it is therein stated that the changes in the testicle are chiefly interstitial, consisting of a round-celled infiltration with slight oedema, the walls of the blood vessels of the tunica and testicle somewhat thickened but in no way comparable to that in syphilitic infections, and with but little or no perivascular round-cell infiltration.

Regarding metastases, the authors state that it is not unlikely that the organisms find their way to the opposite testicle producing minor transient changes there. Some transient enlargement of inguinal glands was also noticed about 10th–14th day; in other cases no swelling was ever detected. The changes in the popliteal nodes characteristic of *pallidum* infections were not seen. No other signs of generalized lesions were found in rabbits inoculated by this method as in syphilitic infections when followed for many months and in several cases over a year. The manifestations of *pertenue* infections are, therefore, essentially local and of a relatively mild or benign character in comparison with *pallidum* infections. The characteristic reaction is a granular periorchitis.

H. S. S.

BOUFFARD (G.). Note sur le traitement du pian par le stovarsol. [**Stovarsol Treatment of Yaws.**]—*Bull. Soc. Path. Exot.* 1925. May 13. Vol. 18. No. 5. pp. 437–439.

Called upon to treat a number of children, mostly aged between 2–5 years, suffering from yaws, upon whom it is difficult to practise intravenous medication, the author decided to make a trial of stovarsol. Two tablets of 0·25 gm. were given on each of two successive days, or in a few more extensive cases three tablets each day, each crushed up and suspended in water taken by the mouth. Lesions had disappeared on the 10th day and these cases are spoken of as cures; 75 cases in all were thus treated at Agboville in the forest region of the Ivory Coast. He saw no case of goundou and, in consequence, does not believe that that condition is a manifestation of yaws; otherwise would he have seen some cases among the population, who all suffer from yaws in childhood.

H. S. S.

ROUVROY. Action du stovarsol sur le pian. [**Action of Stovarsol in Yaws.**]—*Rev. Méd. et Hyg. Trop.* 1925. May–June. Vol. 17. No. 3. pp. 146–147.

A report on two cases of secondary yaws, one an adult, the other an infant treated with stovarsol. In the first case 0·75 gm. was given on the 1st day, 1 gm. on the 3rd to 6th days, when all lesions had dried up and 0·5 gm. on 7th to 13th days, when apparent cure was effected, but the Wassermann reaction remained positive. The infant of 18 months was given 0·25 gm. each day for a week, when diarrhoea set in. This rapidly subsided after castor oil and suspension of treatment. A week later on three successive days the dose of 0·25 gm. was repeated and apparent cure effected. No Wassermann test.

H. S. S.

FISCHER (W.). Die Behandlung der Framboesie mit Novasurol. [**Novasurol Treatment of Yaws.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. July 1. Vol. 29. No. 7. pp. 339–342.

A trial was made with this drug in the case of 84 natives in the Belgian Congo suffering from yaws, cases being under observation for 3 or 4 months. Four intragluteal injections were given at 5–6 days interval, using a 10 per cent. solution—1·2 cc. for children and 2·2 cc. for adults. Results were universally good, and the author recommends this form of treatment on account of ease of administration and because the drug is cheaper than N.A.B.

H. S. S.

VAN DIJKE (M. J.), BAKKER (C.) & HOESEN (H. W.). **Contribution to the Knowledge of Rhino-pharyngitis Mutilans.** -*Meded. Dienst. d. Volksgezondheid in Nederl.-Indië.* 1925. Pt. 2. pp. 148–171. With 20 figs. on 5 plates. [32 refs.]

Their attention being attracted to the question of gangosa—a disease hitherto only admitted conjecturally into the nosology of Java—by a case of total destruction of the nose in a patient casually coming to be treated for malaria, the authors set themselves to collect and investigate local cases of mutilant rhinopharyngitis. As so often happens, the obscure and ambiguous rarity turned out to be a common thing; a plenitude of cases came to light in Java, and from a study of these cases and concurrent critical study of a series of cases of yaws the authors add support to the opinion that gangosa is a tertiary manifestation of yaws.

The authors have recorded the results of their survey with admirable acumen; the record, though long, is not prolix, and should be read in full. Of their first 8 cases of destructive rhinopharyngitis, approached with an open mind, none had a history of syphilis, 4 had undoubted evidence of yaws, 7 (all that were tested) gave a positive W.R., all who stayed for treatment reacted quickly and well to salvarsan, and only 1 revealed an organism having any resemblance to *Cryptococcus mutilans.* Of their next 13 cases of destructive rhinopharyngitis, approached upon a hypothesis, none had a history of syphilis, 11 had a history of yaws, 8 (all that were tested) gave a positive W.R., and those who were treated reacted quickly to salvarsan; moreover, 4 had periostitis of the tibia. Last, of 22 cases of yaws, jointly studied, 3 had obvious lesions of gangosa, 6 had slight ulcerations on or in the nose, and 13 had yaws papules on or in the nose; moreover, in 12 there was periostitis.

Finally, the authors discuss all the various conjectural causes of gangosa; emphasize the arguments from the incidence of the disease, racial and geographical; and, finally, state their conclusions, that "Rhinopharyngitis occurs in Java . . . Can be cured by mercury and salvarsan . . . Is a tertiary affection of yaws." [See also this *Bulletin,* Vol. 20, p. 608.]

A. Alcock.

WAAR (C. A. H.). **Rhino-pharyngitis mutilans (Gangosa).**—*Nederl. Tijdschr. v. Geneesk.* 1925. Mar. 21. 69th Year. 1st Half. No. 12. pp. 1301–1313. With 1 plate & 6 figs. [15 refs.]

The author records a case of gangosa in a Dyak woman at Sintang in Borneo. The process apparently commenced with ulceration of

the palate, later destroying the walls of the nasal passages and involving the supranasal and infra-orbital regions.

Tuberculosis, leishmaniasis and leprosy were excluded. Treponemata were not found, but the condition was considered to be tertiary yaws, as the woman had suffered from yaws previously, this disease being very common among the Dyak population, while syphilis is very rare. Treatment with neosalvarsan, mercury ointment and sol. Ricordi resulted in an arrest of the process without improvement in the appearance. The final condition is described.

H. S. Stannus.

GUTIERREZ (Perpetuo D.). Nodosités Juxta-Articulaires. **Juxta-Articular Nodules.** —*Arch. Dermat. & Syph.* 1925. Aug. Vol. 12. No. 2. pp. 159–170. With 4 text figs. [35 refs.]

In Manila, where the author studied 20 cases, the order of frequency as regards the site of the lesions was found to be: external malleolus, olecranon, knees, trochanter. Sixteen out of the 20 cases gave a positive Wassermann reaction. In the majority a history of yaws 5-10 years previously was obtained and syphilis ruled out. Three nodules were submitted to section and microscopical examination, but no mention of search for or finding of spirochaetes is made. The histological picture from the periphery inwards showed a surrounding loose connective tissue with masses of perivascular round cells with uniform dark-staining nuclei; inside this roughly concentrically arranged dense fibrous tissue was seen, in some places so dense that it had a smooth almost hyaline appearance with dark-staining elongated nuclei scattered between the bundles. Here and there were some accumulations of round cells, perivascular in site in some sections: inside this, again, was an area of looser connective tissue. In one node this tissue is described as consisting of collagen fibrils with elongated nuclei and many epithelioid nuclei, and also showing many round cell accumulations round the blood vessels. In another node the looser fibrous tissue merged into an area staining bright red, consisting of hyaline masses and in places showing a retiform structure with clear meshes of varying sizes and shepes but no definite cellular structure, nor could leucocytes be made out in this eosinophilic mass.

Gutierrez gives an excellent review of the literature up to 1923, tracing the various opinions which have been held as to etiology, he himself believing that the nodules are late manifestations of yaws, and calls attention to the fact, apparently unknown to many writers, that it is necessary to separate clearly from the condition known as juxta-articular nodules the "subcutaneous fibroid syphilomas" described by WEBER, a rare manifestation of syphilis closely resembling that condition as first pointed out by GOODMAN and YOUNG, who state that were it not for the histological picture it would be difficult to differentiate the two conditions which, moreover, both respond to treatment by salvarsan derivatives.

H. S. S.

DUBOIS & MONCAREY. A propos de nodosités juxta-articulaires. **Juxta-Articular Nodules.** —*Bruxelles-Méd.* 1925. Oct. 4. Vol. 5. No. 49. pp. 1453–1455. [4 refs.]

Two independent notes by observers in the Belgian Congo. Dubois points out that there appears to be some danger at the present time of

including under the term juxta-articular nodules more than a single pathological entity and demands that a more careful differential diagnosis be made in order to distinguish this condition as defined by JEANSELME from somewhat similar lesions produced by syphilis and Oncocerca infections. He found J.A.N. common in the middle Congo, but rare in Uélé and in Kasaï. In Mayumbe, among 3,000 individuals examined, 1–2 per cent. showed this affection, and he points out that here yaws is very widespread, that gangosa and other bony lesions of framboesial origin are common and goundou occurs, but more rarely. He believes in a framboesial etiology for J.A.N., and referring to the European case of BRODEN and BERNARD (this *Bulletin*, Vol. 22, p. 799), says, it would seem most unlikely that a European could have had yaws without knowing it, and appears to suggest that this case was due to some other cause and was, in fact, not a case of J.A.N.

Moncarey states that the condition is so common among the native inhabitants of Aruwimi, south of the Congo, that little attention is paid to it. Removal of nodules was practised on 18 subjects, including 1 European—a Portuguese. In this case multiple, symmetrical, mobile nodes occurred at the elbows, ulnar crests and heads of fibulae. Excision of the nodes at the elbows was followed by the rapid appearance of others the size of haricots in the same situation within a month. There was a doubtful syphilitic history, but no Wassermann reaction was done. Among the native cases, 13 were men, 4 women. In 14 the ulnar margin was affected (in 10 bilaterally); ulnar and head of fibula in 1 case; knees, elbow and ribs in 1 case; sacrococcyx in 1 case. 14 had microfilariae in their blood; one was syphilitic; one showed tertiary framboesial bone lesions. [No mention is made of antecedent history of yaws. Sections from excised nodules showed the pathological picture of chronic inflammation. In 2 sections microfilariae were seen imprisoned between fibrils of fibrous tissue. The author refers to the widely divergent views held as to etiology, and puts forward the hypothesis that repeated trauma is an important factor, and that in the injured tissue it may be at one time a microfilaria, at another a spirochaete, or other organism, which finds a nest and plays a part in setting up the chronic inflammatory reaction.

H. S. S.

SOBERNHEIM. Spirochätenbefunde bei den sogen. Malayenfibromen (Demonstration). [**Discovery of Spirochaetes in Juxta-Articular Nodules.**]—*Cent. f. Bakt.* 1. Abt. Orig. 1924. Oct. 20. Vol. 93. No. 1/4. pp. 260–261.

A short note recording the demonstration of spirochaetes of pallida type by the silver impregnation method of LEVADITI in sections prepared from a case of juxta-articular nodules.

H. S. S.

LEGER (Marcel). La syphilis dans les colonies françaises. Les avantages de la méthode syphilimétrique Vernes dans la lutte contre l'endémie. [**Syphilis in French Colonies. Value of Vernes' Syphilimetric Tests in its Control.**]—*Rev. Méd. et Hyg. Trop.* 1925. May–June. Vol. 17. No. 3. pp. 116–130. [27 refs.]

The first part of this paper is devoted to a review of what is known of the incidence of syphilis in the French colonies, with references to

the publications whence information has been gathered. They are placed in the order in which the disease is most prevalent, as follows: Indochina, Antilles, Indian Settlements, Madagascar, West Africa, New Caledonia, and references are made to the devastating effects of this scourge upon birthrate, etc. The point is also made that, contrary to the belief of LE DANTEC, syphilis of native races, when communicated to Europeans, may give rise to so-called parasyphilitic affections.

The second part of the paper deals with the necessity of accurate diagnosis and adequate treatment controlled by laboratory examinations, pointing out on the one hand that 10 per cent. of cases of syphilis in France are ignorant of their affection, the number being much greater among native races, and on the other hand the efficacy of treatment. Determination of cure should be estimated by a continuous method such as the syphilimetric method adopted by VERNES, who plots a curve for his flocculation tests carried out at regular intervals. The method of carrying out these tests is given, and mention made of the photometer employed in making readings.

H. S. S.

NOGUE (M.) & LHUERRE (H.). Un cas de syphilis indigène. **Case of Syphilis in a Native.**]—*Bull. Soc. Path. Exot.* 1925. May 13. Vol. 18. No. 5. pp. 431–433. With 1 text fig.

This case of a Toucouleur, aged 26, was shown to the French West African Medico-Chirurgical Society.

The patient presented the following lesions.—The left eye was destroyed and the eyelids adherent. The right eye was the seat of a marked kerato-conjunctivitis with distortion of the lids. The nose and upper lip presented a condition resembling that often described under the term gangosa, while crusted ulcerating lesions were found over the frontal regions and part of the face. There were also arthritis of the right knee joint and an area of osteo-periostitis in the middle part of the left tibia. The condition was said to have commenced at 13 years of age, and any knowledge of a primary chancre was denied. The diagnosis was hereditary syphilis and the patient stated that his mother and brothers were also affected with this disease. Under treatment with N.A.B. and potassium iodide in big doses the open lesions began to heal and others to show signs of resolution.

[Such is the description of a case which must be familiar to practitioners in many parts of the tropics. This case was undoubtedly one of syphilis, though some have been thought to be due to yaws. It would be interesting to have more definite information whether such a case is one of hereditary disease or whether it be one of infection during childhood, the primary lesion being extragenital and unremarked.]

H. S. S.

PFISTER (Maximilian O.). **Syphilis: Central Nervous System and Antisyphilitic Treatment.** *China Med. Jl.* 1925. Aug. Vol. 39. No. 8. pp. 688–700. [26 refs.]

The author seeks an explanation for "the increasing frequency of syphilitic manifestations of the central nervous system," and believes that "the modern treatment of syphilis has a great deal to do with these changes." In support of the first statement he refers to the history of the early recorded cases of general paralysis in Europe

and to the absence of the disease at the present day in countries where there has been little contact with "western" (European) civilization though syphilis be common, while in countries with growing contact the incidence of neuro-syphilis has been observed to increase *pari passu*. The pathogeny of syphilis of the nervous system is discussed, also the theory of there being a neurotropic virus. His own observations in China, the author holds, support the second part of his thesis. Records of 238 cases of nervous system syphilis were made, including 59 cases of meningitis, 16 meningo-myelitis, 24 transverse myelitis, 11 spastic paralysis, 24 vascular form, 7 neuritis, 34 other forms, 50 tabes and 13 G.P.I. All these had, he believes, received previous treatment which had, it is considered, in many precipitated the nervous lesion. The author "has never seen a single case of acute syphilitic meningitis which had not previously received salvarsan treatment," and states also as one of his conclusions that the development of metasyphilis cannot be prevented by even a most energetic treatment with mercury and salvarsan. [Thus Dr. Pfister would lead one to believe that all salvarsan treatment of syphilis is bad, but one gathers that he refers to the treatment as carried out to-day in China, and his paper is written really to arouse the interest of practitioners in China. Incomplete and irregular treatment has long been known to be dangerous, but whether or not such treatment is directly provocative of nervous lesions is uncertain. Some of the author's statements appear rather contradictory, and some of his postulates open to doubt.]

H. S. S.

TSANG (M. L.). **The Importance of Venereal Clinics, with a Report of 400 Cases from the St. Luke's Genitourinary Clinic, Shanghai.** — *Nat. Med. Jl. China.* 1925. June. Vol. 11. No. 3. pp. 172–187. [6 refs.]

The author is of opinion that legislative measures in an antivenereal campaign would yield no result, that little can be hoped for from education among a population of whom 90 per cent. are illiterate, and that, therefore, treatment affords the best chance of diminishing the incidence of this scourge which affects possibly a third of the population. Among the 400 cases presenting themselves for treatment there were 132 cases of syphilis, of which 106 were primary; the secondary cases call for no special mention; 16 tertiary cases all showed breaking down gummata presumably of skin. [Obviously, where there is such a large proportion of early cases, the clinic is doing a most useful work.]

H. S. S.

DE VRIEZE (T. J.). Loopende behandeling van geslachtszieke militairen. [**Ambulatory Treatment of Soldiers suffering from Venereal Diseases.** — *Geneesk. Tijdschr. v. Nederl.-Indië.* 1925. Vol. 65. No. 2. pp. 254–258.

In the past all cases of venereal disease in the Dutch East Indian army have been hospitalized for treatment. De Vrieze introduced a system whereby all cases of syphilis, so long as they had no open lesions, and all cases of gonorrhoea were treated at an out-patient clinic, and remarks no increase in the number of complicated cases. Apart from the advantages in morale among the men there was a considerable saving in expenditure.

W. J. Bais.

BAERMANN (G.). Die Verwendung von gebrauchsfertig gelöstem Salvarsan (Sulfoxylsalvarsan) in den Tropen. [**The Use of a Ready Prepared Salvarsan Solution (Sulfoxylsalvarsan) in the Tropics.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Feb. Vol. 29. No. 2. pp. 72–91.

Sulfoxylsalvarsan is put up in solution, ready for use. The author describes his experience in using it in the treatment of yaws and syphilis, compared with results of treatment with neosalvarsan, neosilbersalvarsan, and silbersalvarsan.

Syphilis.—95 cases treated with sulfoxylsalvarsan; 153 cases with silbersalvarsan; and 82 cases with neosilbersalvarsan.

Yaws.—178 cases treated with sulfoxylsalvarsan; 150 with silbersalvarsan; 65 with neosilbersalvarsan; and 1,046 with neosalvarsan.

In each type group of these diseases sulfoxylsalvarsan gave better results, clinical and serological (Wassermann reaction), than did the others.

[Arsenobenzol preparations are costly, not easy to use, and not without danger to the patient. They are still necessary in syphilis. For yaws we have the equally effective, very cheap, safe, almost fool-proof bismuth.]

H. M. Hanschell.

LE ROY DES BARRES. Note sur le traitement de la syphilis par le tréparsol. **Treparsol Treatment of Syphilis.**—*Bull. Soc. Méd.-Chirurg. Indochine.* 1924. Apr. Vol. 2. No. 4. pp. 65–67.

Three cases of secondary syphilis were treated with this drug—formyl-meta-amino-para-oxyphenylarsenic acid—in tablet form by mouth. 1 gm. per diem for from 4–8 weeks, with intervals, caused disappearance of symptoms and rendered the Bauer reaction negative.

H. S. S.

SEI (S.) & WEISE (W.). Studien ueber den Wirkungsmechanismus der Luestherapie mittels Wismut bei intravenöser Darreichung. [**Syphilis Therapy by Intravenous Bismuth. Its Mode of Action.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Oct. 15. Vol. 29. No. 10. pp. 554–559. [7 refs.]

Using rabbits, the authors injected into the large veins of the ear measured quantities of sodium tri-bismuthyl tartrate in watery solution according to body-weight. After varying periods of time had elapsed these animals were bled under urethan narcosis from the jugular vein, and the bismuth content of the blood was estimated by a method given in detail; estimations in some animals were also made in regard to the bismuth content of the various organs of the body. The results showed that the drug disappears rapidly from the peripheral circulation. Rapid excretion by the kidney and bowel occurs; at the same time rapid distribution to all the organs of the body was found including the kidney and bowel, but while the neuro-muscular system retained little, the proportion in the spleen was remarkable. The authors appear to believe that the spirochaeticidal action is a direct one by the small amount of bismuth circulating in the blood.

H. S. S.

FRASER (A. Reith). **"Witkop."** [Correspondence.]—*Med. Jl. S. Africa.* 1925. Apr. Vol. 20. No. 9. p. 282.

The late Dr. McARTHUR's papers on syphilis among the natives of Bechuanaland, in which he described the condition called locally "witkop" as a manifestation of syphilis, were reviewed in this *Bulletin*, Vol. 21, p. 399. Drs. MITCHELL and ROBERTSON, on the other hand, finding a fungus of the favus group in a small number of cases they examined believe the condition to be due to this infection. [*l.c.* Vol. 22, p. 793.] This has stimulated Dr. Fraser to defend Dr. McARTHUR's original beliefs. The point at issue is whether *witkop* is the result of a syphilide affecting the scalp and the fungus affection secondary, casual, and not universally present, or whether the condition is specifically due to the fungus which is present in every case, many of whom are by chance syphilitics. The point is an interesting one and should be capable of solution.

H. S. S.

EARLY (P. V.). **The Flocculation Test for Syphilis, in Small Clinics.**—*China Med. Jl.* 1925. Feb. Vol. 39. No. 2. pp. 140–145. [3 refs.]

After reviewing briefly the comparative merits of the Wassermann and various flocculation reactions, the author states the purpose of his paper is to emphasize the fact that the F.R. provides a test for syphilis of real diagnostic value, which does not demand specialist training or elaborate equipment. His experience is based on 160 tests, including 9 on C.S.F. The Wassermann reaction was not employed as control. The paper discloses that where the clinical diagnosis was reasonably certain, then the F.R. could be cited as one other piece of evidence in support of the diagnosis. [The reviewer would point out that these serum tests are indispensable for diagnosis only in the absence of clinical data; and also for the control of treatment. In these purposes the F.R. cannot yet replace the Wassermann reaction, though it may ultimately, when the F.R. has been further studied, do so. One hopes for this consummation. At present a diagnosis based mainly on the result of the F.R. is more likely to be in error than one based on the W.R. result, for all the F.R. tend to give a higher percentage of false positives.]

H. M. Hanschell.

WEBB (W. Leslie). **A Simple Modification of the Flocculation Method of Serum Diagnosis in Syphilis, suitable for Use in isolated Tropical Treatment Centres.** *Trans. Roy. Soc. Trop. Med. & Hyg.* 1925. Feb. 19. Vol. 18. No. 8. pp. 432–438.

This is an important paper, and timely; for the tackling of venereal disease in the African population of the empire is receiving serious consideration by governments. In Uganda syphilis constitutes one of the most important medical problems. The Wassermann test can be carried out only within a limited area surrounding the central Venereal Disease Laboratory at Mu'ago. If the treatment of every case of yaws and syphilis were controlled by serum tests treatment would not be abandoned until the serum reaction had been influenced. In 1923–1924, at Mulago, 16,000 serums were tested, both by Wassermann and by one or other Sachs Georgi reaction. The latter was found to be very distinctly inferior to the former.

The flocculation test now described by the author is claimed to be simple enough to be performed at any "out centre," and by a native after a few weeks' training, and its results are in closer agreement with results of Wassermann test than those of any other flocculation test hitherto tried at Mulago. The author gives a list of the simple apparatus required, and the technique of preparing from sheep's heart a cholesterinized extract (which can be produced in bulk for distribution from a central laboratory).

Method of test.—1 cc. of 1 in 11 emulsion of cholesterinized heart extract in 0·9 per cent. saline is added to 0·2 cc. of fresh, *active* patient's serum and the mixture left at room temperature for 24 hours. Serums mixed with blood cells or clot are not suitable for testing by this method. Absolute sterility of receptacles is not, but "quite clean" is, necessary. In preparing the antigen-extract mixture, which is the critical part of the test, the aim is to obtain as turbid a mixture as possible. How to ensure this is described carefully. Flocculation of any degree is easily distinguished by the naked eye. In discussing the result of comparison between the Wassermann and the above flocculation reaction, the author makes the very interesting statement that in Uganda syphilis, far more so than in Europe, appears to be a self-curing disease: and "many natives who *undoubtedly* [reviewer's italics] have had syphilis and received no effective treatment for the disease, show no active signs, and consistently give negative results to the Wassermann test."

(1) Of the 650 serums tested, 527 (81 per cent.) gave results identical with Wassermann, according to an arbitrary use of symbols to denote degrees of flocculation.

(2) 578 serums (89 per cent.) agreed with Wassermann, or differed from it by one degree only.

(3) 626 serums (96 per cent.) agreed with Wassermann, or differed from it by 2 degrees.

(4) All known negative controls from European staff were negative to both tests throughout.

(5) The serums in which flocculation test was negative, whilst Wassermann was positive, were, in those cases where clinical details were obtained, either from cases which appeared to be non-syphilitic or from known cases of syphilis without active signs who had had treatment.

(6) Of 131 serums negative to Wassermann only 3 showed definite flocculation: clinical details are unknown in two of them, in the third there appeared to be some excuse for flocculation.

(7) Nearly all results are clear cut. Out of 650 serums the reaction was doubtful in 3 only.

The author claims that results of this flocculation test compare very favourably with results of the Wassermann test. Great confidence may be placed in a positive flocculation reaction, and furthermore, where intensive antisyphilitic work is being carried out under conditions such as exist in Uganda, which require that a large amount of the diagnosis and treatment must be carried out by native assistants at up-country medical subcentres, the application of this test by these native assistants would greatly increase the effectiveness of the campaign undertaken by them.

H. M. H.

LLOYD (R. B.). **Serum Reactions in Syphilis.**—*Indian Med. Gaz.* 1925. Jan. Vol. 60. No. 1. pp. 19–24. [36 refs.]

The author sums up a very interesting and careful review of this important subject, as follows :—

" (1) While there are material differences amongst some of the leading workers regarding the value of the flocculation tests, there is a general consensus of opinion that the Wassermann reaction remains for the present the best test for the detection of syphilis, though one or more of the flocculation tests may be done in addition.

" (2) The great advantage of the Wassermann test is its high degree of sensitiveness, combined with an almost total absence of false positives.

" (3) While the earlier flocculation tests have not proved as satisfactory as was expected, the more recent developments are much more promising. Improvements in technique may very possibly enhance the value of the Sachs Georgi test. The Kahn test is simple and apparently very serviceable. The former of these tests is, however, not quantitative. The Dreyer Ward test is valuable and quantitative and the technique should admit of simplification.

" (4) It is probable that some form of flocculation test will eventually attain to extended use ; although the difficulty in reading intermediate grades of positive reaction is at present considerable.

" (5) The occurrence of non-specific reactions in flocculation tests needs further examination.

" (6) Before any particular flocculation reaction can be accepted as the standard test, it must be clearly shown to be capable of yielding satisfactory results with cerebro-spinal fluid ; since this is the direction in which syphilis therapy is concentrating."

H. M. H.

HEINEMANN (H.). Weiterer Beitrag zur Frage der Bedeutung der serologischen Blutuntersuchung in tropischen Ländern. [**Value of Serological Blood Examinations in the Tropics.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Apr. 1. Vol. 29. No. 4. pp. 179–183. [10 refs.]

Comparison of results of the Wassermann reaction (2 extracts) and Meinicke's Trübungsreaktion (2 methods) in a comparatively small number of cases of syphilis, yaws, malaria, leprosy, and other illnesses gave, on the whole, most trustworthy results for the Wassermann reactions.

H. M. H.

SCHIJVESCHUURDER (W.). Over de Goudreactie van Lange. [**Lange's Goldsol Reaction.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1925. Vol. 65. No. 2. pp. 150–156. [11 refs.]

Schijveschuurder quotes Cambronero and Palance's method for the preparation of a sensitive and stable colloidal gold solution and describes briefly four cases of cerebrospinal syphilis in which the goldsol reaction was of decisive diagnostic importance. In countries where the value of the Wassermann test is diminished by the endemic occurrence of yaws Lange's reaction may become of some importance in differential diagnosis.

W. J. Bais.

AMOEBIASIS AND DYSENTERY.

AMOEBIASIS.

BAILS (J. E.). **Amoebic Dysentery in Canada.**—*Canadian Med. Assoc. Jl.* 1925. Oct. Vol. 15. No. 10. pp. 1012–1016. [28 refs.]

It having been stated that amoebic dysentery in Canada is rare, the author's object is to report a case in a woman who had never been out of Canada, and to draw attention to the fact that infection with amoebae is not a rare condition in subtropical and temperate zones. The case is described and, from a critical survey of the literature, the author concludes that it is the third to be reported as having originated in Canada; although it is also his opinion that with careful examination of the stools of cases of mucous colitis, amoebae would be encountered in as high a proportion of cases in Canada as in England or the United States.

H. M. Hanschell.

KESSEL (J. F.) & WILLNER (Otto). **Some Clinical and Laboratory Aspects of Amoebiasis with a Preliminary Report on Yatren Treatment.**—*China Med. Jl.* 1925. May. Vol. 39. No. 5. pp. 383–396. [20 refs.]

From July 1, 1922, to September 30, 1923, 6,200 patients were admitted to the Peking Union Medical College Hospital, and 54 (0·87 per cent.) were found to be suffering from amoebiasis. From October 1, 1923, to May 31, 1924, out of 1,800 patients, 129, or 7 per cent., were found to be similarly affected. The sudden increase in the percentage of positive findings is due to improved diagnostic procedures. Classified according to the coincident clinical symptoms it was found that of the second series of 129 positive for amoebiasis, 16·7 per cent. of the Chinese and 30 per cent. of the foreigners suffered from acute or chronic colitis, 3·1 per cent. of the former from liver abscess, 11·5 per cent. and 52 per cent. respectively from undefined gastro-intestinal symptoms, 33·3 and 9 per cent. from minor ailments, while 34·4 per cent. of the Chinese and 9 per cent. of foreigners were symptomless, healthy carriers. The hesitation felt in treating healthy chronic carriers of amoebic infection with such a debilitating drug as emetine-bismuth-iodide, induced the authors to try yatren on healthy carriers of *E. histolytica* amongst the employees with the idea of finding the minimum dosage which would effect clearance of the stools with the least discomfort and shortest absence from work. It was given in the following dosage—1st, 3rd, 5th and 7th days—0·5 gm. in gelatine capsules, six times daily; 2nd, 4th, 6th, 10th, 14th and 21st days—3·0 gm. dissolved in 200 cc. of distilled water at 80° C. given as an enema. Rest in bed seven days and for half a day on the 10th, 14th and 21st days. Dietary arranged according to the degree of purgation. In acute cases of amoebiasis 0·065 gm. of emetine hydrochloride, in addition, was injected intramuscularly for 3–6 days till acute symptoms had subsided. Out of 19 cases treated with yatren 17, or 92 per cent., remained negative for a period of six months after completion of treatment. Examination was made of six consecutive stools. The patients passed stools free from *E. histolytica* cysts after the third day of treatment, so that in this respect yatren treatment does not differ from emetine-bismuth-iodide.

P. H. Manson-Bahr.

Voss (J. A.). Nogen tilfaelder av amöbedysenteri. [**Some Cases of Amoebic Dysentery.**]—*Norsk Mag. f. Laegevidensk.* Kristiania. 1925. July. Vol. 86. No. 7. pp. 703–707. With 1 text fig.

A man of 56 was admitted to hospital in December with an attack of dysentery. The faeces were examined for dysentery bacilli with a negative result—not for amoebae, which were hardly thought of. The patient died. Ulcerative colitis was found at the autopsy, and amoebae in sections of the intestinal wall. The next day the nurse contracted dysentery and many amoebae were discovered in her stools. Information was now obtained that the dead man's son had been in hospital in Calcutta with the disease, and that the father had fallen ill three days after the son arrived home. The faeces of the son and of a friend of his, both sailors, showed the presence of encysted amoebae. They had both been in hospital in Calcutta together with dysentery 3 or 4 months previously. After returning to Norway one of them developed an acute attack of dysentery, the motions consisting only of slime. Motile forms of amoebae were found. The three patients received 0·04 gm. emetine and 0·50 gm. stovarsol per diem. The nurse quickly got well, but it is too early to ascertain the effect of the treatment on the two chronic cases.

These cases prove that even in the middle of winter in Norway amoebic dysentery can be propagated by contact from one person to another, thus giving rise to small epidemics.

E. E. Atkin.

Trabaud. Formes anormales de l'amibiase. [**Unusual Forms of Amoebiasis.**]—*Rev. Méd. et Hyg. Trop.* 1925. Sept.–Oct. Vol. 17. No. 5. pp. 193–198.

Septicaemic amoebiasis.—A careful description of two cases at Beyrouth :—

Case 1. Intermittent fever, icteric tinge in skin, biliary pigments and urobilin in urine ; no malaria parasites found. Negative blood culture ; 20,000 leucocytes, 81 per cent. polys, 14·5 per cent. L. monos. No amoebae or cysts found in stools. Later, enlargement of liver and diarrhoea developed and active *E. histolytica* found in stools.

Case 2. Intermittent fever ; mental confusion, unequal pupils, coma alternating with delirium. Later enlargement of liver ; C.S.F. normal. Negative blood culture ; no malarial parasites found. Urine : albumen, bile salts and pigments, indican and much urobilin. 9,050 leucocytes, 85·5 per cent. polys, 18 per cent. L. monos. After his recovery this patient gave history of having been 2 months previously treated in hospital for diarrhoea with amoebae in stools.

In both cases, after the failure of quinine and other remedies, emetine injections rapidly brought about convalescence. The author concludes that both cases were amoebicaemia. [A conclusion based on evidence that is somewhat slender.]

H. M. Hanschell.

Mayers (Laurence H.) & Hirsch (Edwin F.). **Differentiation of Amebic Dysentery from So-Called Idiopathic Ulcerative Colitis.** – *Amer. Jl. Med. Sci.* 1925. July. Vol. 170. No. 1. pp. 43–53. With 1 fig. [5 refs.]

A description is given of 6 cases of ulcerative colitis, in which amoebae, as the cause, were demonstrated. Careful search for amoebae should be carried out before a diagnosis of idiopathic ulcerative colitis

is made. The usual medication, including large dose of kaolin, bismuth and other astringents, is not indicated where the infection is amoebic. Because of the extensive ulceration and friability of the bowel wall in amoebic dysentery, the proctoscope should be used with extreme caution.

H. M. H.

PETZETAKIS. Amibiase urinaire. [**Urinary Amoebiasis.**]—*Bull. Soc. Path. Exot.* 1925. June 10. Vol. 18. No. 6. pp. 478–485. With 2 figs. on 1 plate. [25 refs.]

The author follows up his former publications on extra-intestinal amoebiasis with a detailed account of two cases of amoebiasis of the urinary system :—

Case I. Primary amoebic cystitis. No previous dysentery : patient aged 35 years complained of frequency of, and pain during, micturition ; prostate normal. Urine contained some albumen, no sugar. After centrifuging it showed red and white blood cells, epithelial cells, no casts, no renal cells ; active amoebae were found—many of them containing red blood cells. Emetine injections were followed by disappearance of the amoebae in the urine and cessation of the symptoms.

Case II. Amoebic cystitis with haematuria in the course of amoebic dysentery. In this case frequency of and pain during micturition began before the dysenteric symptoms. The haematuria was noticed later, after the dysentery onset. Examination of faeces showed amoebae with sluggish movements. The urine contained albumen ; no sugar ; and after centrifuging showed many red and white blood corpuscles and also active haematophagic amoebae. After emetine injections amoebae disappeared from stools and urine and symptoms ceased.

The author discusses these cases, compares them with cases of extra-intestinal amoebiasis previously reported by him and by others, and refutes the possibility of these organisms being leucocytes ; the microphotographs show clearly that they are amoebae. He urges that amoebae should be looked for in all cases of cystitis, and that disinfection of urine in amoebiasis of any sort is necessary, as well as disinfection of stools and sputa.

H. M. H.

GARCIÁ FAURE (M.). Un caso de amebiasis pulmonar solitaria. [**Case of Amoebiasis of the Lung Alone.**]—*La Prensa Méd. Argentina.* Buenos Aires. [Summarized in *Rev. Española de Med. Cirug.* Barcelona. 1925. Oct. Vol. 8. No. 88. pp. 577–578.]

A man, 44 years of age, had had repeated attacks of dysentery at intervals, but none for two years prior to coming to hospital complaining of pain in the back, sweating, shivering, cough, with expectoration of blood and chocolate-coloured pus. No amoebae were found in the sputum, but treatment with emetine hydrochloride subcutaneously [two series of daily injections of 0·08 gm. were given, but the number of injections is not stated] together with three intravenous injections of salvarsan led to great improvement and the patient was able to leave hospital, but he reported later that the cough and expectoration had returned as severely as before. [The proof that the pulmonary condition was due to *E. histolytica* appears to be somewhat slender.]

H. Harold Scott.

MacNeal (Ward J.) & Klemperer (Paul). **Amebic Abscess of the Liver.** - *Amer. Jl. Trop. Med.* 1925. Sept. Vol. 5. No. 5. pp. 339–349. With 8 text figs. [2 refs.]

A case of amoebic dysentery with liver abscess, terminating fatally. Typical in clinical history and course, but unrecognized until autopsy. The disease was contracted apparently in New York city. *Entamoeba dysenteriae* tends to travel through the blood stream. To avoid mistakes several staining methods should be employed to identify entamoebae in unusual locations.

H. M. H.

Burnie (R. M.). **A Case of Empyema simulating Abscess of the Liver.** [Miscellanea.]—*Ann. Trop. Méd. & Parasit.* 1925. July 16. Vol. 19. No. 2. pp. 261–262.

The clinical record of this case, which deals with the differential diagnosis of empyema from liver abscess, does not call for comment.

P. H. M–B.

Manson-Bahr (Philip H.) & Morris (R. M.). **Yatren in the Treatment of Amoebic Dysentery. With a Note on the Results of Stovarsol in Certain Cases.**—*Lancet.* 1925. Sept. 12. pp. 544–546. [25 refs.]

Yatren. An account of four cases, all typical examples, of amoebic dysentery treated by yatren pills (1½ gm. daily) and yatren solution 2½ per cent.—200 cc. *per rectum*; controlled by periodical microscopic and sigmoidoscopic examinations. Maximal benefit is obtained only by yatren *per rectum* as well as by mouth. No toxic disturbances were noted. Cure is apparently permanent; the therapy is more pleasant to the patient than any other yet evolved, and no severe diet restrictions are necessary.

Stovarsol the authors regard as a valuable adjunct in the treatment of amoebiasis, especially of the chronic cyst passer. An account of two cases is given, in which apparent permanent absence of cysts was obtained by stovarsol, after E.B.I. had failed. To avoid toxic symptoms, two tablets (gr. 8) by mouth daily for 7 days, or one tablet (gr. 4) daily for 14 days, should not be exceeded.

H. M. H.

Mühlens (P.). 5 Jahre Behandlung der Amöbenruhr mit "Yatren 105." [**5 Years' Experience of Yatren in the Treatment of Amoebic Dysentery.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Oct. 15. Vol. 29. No. 10. pp. 491–507. [46 refs.]

The author quotes Kessel and Wilder (Singapore Congress, 1923):—

		Emetine.	*Yatren.*
Cost per treatment	.....	Mex. dollars 5.60	Mex. dollars 6.40
Time in hospital	.....	12 days	7 days.
Working days lost	.....	26 days	9½ days

and concludes, in agreement with Kop and Manson-Bahr, that yatren is indisputably the best and least toxic drug to-day for the treatment of amoebic dysentery. The author claims for it efficacy also in chronic colitis and bacillary dysentery. The importance of this drug in all attempts to stamp out the disease, by destroying amoebae and cysts in most dysentery cases and cyst passers, is emphasized.

H. M. H.

HUPPENBAUER (C. B.). Die Yatren-105-Therapie der Amöbenruhr. '**Yatren Treatment of Amoebic Dysentery.**'—*Muench. Med. Woch.* 1925. Oct. 23. Vol. 72. No. 43. pp. 1838–1840.

An address delivered to the German Society of Tropical Medicine on the 25th Anniversary Jubilee of the *Institut für Schiffs- und Tropen.-krankheiten*, Hamburg.

Just as the discovery and employment of emetine constituted, in its day, a triumph for tropical medicine, so yatren in turn, which replaces emetine in the treatment of amoebiasis, is a yet more notable triumph. Attention is drawn to the unanimity of satisfaction with yatren expressed by many authors, whom he names, in Germany, in Holland and the Dutch colonies, in China, Japan, South America, Belgium, and in the British Empire. The supreme test of the value of yatren is its efficacy in the treatment of chronic amoebiasis and its complications—just where emetine and E.B.I. failed. The five years that have elapsed since MÜHLENS and MENK, of the Hamburg Institute, brought out the yatren treatment of amoebiasis have seen its spread world-wide as the treatment of choice for all amoebic conditions. It is claimed, not unjustly, as a veritable victory for German chemistry and pharmacology.

H. M. H.

i. DRBOHLAV (Jaroslav J.). Une nouvelle preuve de la possibilité de cultiver *Entamoeba dysenteriae* type *histolytica*. [**A Fresh Proof of the Possibility of Cultivating** *E. histolytica*.]—*Ann. Parasit. Humaine et Comparée.* 1925. Oct. Vol. 3. No. 4. pp. 349–357. [6 refs.]

ii. ——. Culture d'*Entamoeba dysenteriae* type *tetragena minuta*. '**Cultivation of** *Tetragena* **Type of** *E. histolytica*.'—*Ibid.* pp. 358–360.

i. The author claims to have given fresh proof of the possibility of culturing *E. dysenteriae*. He worked with two strains, isolated from patients in England, and a third strain from an autochthonous case in Paris. This French strain, actually 65 times subcultured during six months, was still in good condition. The amoebae had kept all their morphological and biological characters. Many attempts at subculture from infected cats proved always easy to effect. Several media were used; the most convenient as a routine measure is N.N.N. warmed. This medium serves well also for the culture of Trichomonas and Blastocystis. It was found that adding 1 per cent. dextrin to the Ringer's solution used in preparing the "ovomucoide" liquid added to the various solid media prevented the development of Blastocystis. Other details given concern the importance of pH reaction of the medium, temperature, and the amount of liquid used.

For success in amoeba culture certain prescriptions, given in this paper, must be strictly followed: Material must be freshly voided and warm. The medium must be at 37° C. at the moment of inoculation. To examine amoebae of any species, it is indispensable to use the microscope-in-warm-chamber.

The author expresses his acknowledgment to Professor BRUMPT and Dr. LANGERON for suggestions and help in this work and for laboratory room.

ii. *E. dysenteriae* type *tetragena minuta* was cultivated in the same way as *E. dysenteriae* type *histolytica*; morphological characters are practically the same, but their biology differs somewhat. The absence of haematophagous amoebae in a cat inoculated with cultures of *minuta* and the failure to cultivate *minuta* in vitro with red blood cells is in contrast to what happened with *histolytica*. 38 subcultures of *minuta* had been obtained in 3 months.

H. M. H.

GUÉRIN (F. H.) & PONS (R.). Culture d'*Entamoeba dysenteriae* par le procédé de W. C. BOECK et Jaroslav DRBOHLAV. [**Cultivation of *E. dysenteriae* by Boeck and Drbohlav's Method.**]—*Bull. Soc. Path. Exot.* 1925. July 8. Vol. 18. No. 7. pp. 517–520. [1 ref.]

The authors claim that their experiments confirm the results obtained by BOECK and DRBOHLAV in the cultivation of *Entamoeba dysenteriae*, and also GAUDUCHEAU's results in cultivating *Endolimax phagocytoides*.

H. M. H.

GUPTA (B. M. Das). **A Note on the Cultivation of an Entamoeba from a Monkey** (*Macacus Rhesus*).—*Indian Med. Gaz.* 1925. July. Vol. 60. No. 7. p. 323. [2 refs.]

Following the technique of BOECK and DRBOHLAV, the author has cultivated not only an Entamoeba taken from a monkey 4 hours after the monkey's death, but also *E. histolytica* from kittens infected from a hospital case of dysentery.

A. A.

BRUMPT (E.). Étude sommaire de l'"*Entamoeba dispar*" n. sp. Amibe à kystes quadrinucléés, parasite de l'homme. [**Brief Study of "*E. dispar*" n. sp., an Amoeba of Man with Quadrinucleate Cysts.**]—*Bull. Acad. Méd.* 1925. Nov. 3. Year 89. 3rd ser. Vol. 94. No. 35. pp. 943–952. With 1 text fig.

Since WALKER and SELLARDS published their classical researches in 1913, it has been generally recognized that persons infected with *Entamoeba histolytica* are of two different kinds—those who are more or less healthy and display no clinical symptoms, and those who suffer from more or less grave disorders attributable to their infections. Amoebic carriers of these two classes—distinguished by WALKER as "contact" and "convalescent" carriers respectively—have been frequently discussed, and various more or less unsatisfactory "explanations" of their existence have been advanced. In the present note Prof. Brumpt revives an explanation previously offered by SHIMURA, and others, and already rejected by the majority of competent workers: namely, that the difference between a contact and a convalescent carrier is referable to a specific difference subsisting between their amoebic parasites. Brumpt, in fact, now maintains (though he does not express himself in these words) that the species of amoeba generally called *E. histolytica* (=*E. dysenteriae* of Brumpt) really comprises two distinct species—a pathogenic one, to which he restricts the familiar name, and a non-pathogenic one for which he proposes the new name *E. dispar*. In his view, accordingly, the "healthy contact

carrier of *E. histolytica*" displays no symptoms because he is not really infected with *E. histolytica* at all, but with a very closely similar though entirely harmless organism.

This interpretation is here supported by a series of observations made upon a subject infected with "*E. dispar*." From the facts and experiments recorded, it appears that the amoeba in question is not distinguishable morphologically from *E. histolytica*—a weighty argument against its specific individuality—but by various minor diversities of a physiological order. The organism is said to live in its human host as a commensal—not as a tissue parasite. In cultures, likewise, it lives saprozoically. It is far less avid of red blood-corpuscles than is *E. histolytica*. It is less pathogenic for the cat—infecting this animal less readily, and causing in it a more superficial ulceration. And it is further distinguished "by its vast geographical distribution, and the immense number of individuals in which it is found."

Apart from its mode of nutrition in the human host, "*E. dispar*" thus appears to differ from *E. histolytica* in no specifically significant feature. And even this character now seems dubious: for the work of BOECK and DROHLAV—see this Bulletin, Vol. 22, p. 727—has shown that typical pathogenic strains of *E. histolytica* are able to live saprozoically in cultures; and if they can do so outside the body, it is at least possible that they can do the same inside it.

Attentive perusal of this note cannot fail to reveal, to any experienced student of the intestinal amoebae of man, that it deals not with a "new species" but with an old friend—or enemy—under a new name. "*E. dispar*" depends, for its validity as a species, upon a certain interpretation of particular facts already well known and recorded; while other facts—which are not here discussed—can be adduced with even greater force against it. We have already, for example, experimental evidence from WALKER (1913) to show that infection with the same strain of *E. histolytica* may give rise to amoebic dysentery in one man, but not in another. According to Brumpt's interpretation it would seem that the very same species of amoeba would here be called "*E. dysenteriae*" in the one host and "*E. dispar*" in the other—if its "pathogenicity" were regarded as a specific criterion.

When all the facts relating to amoebic carriers are fully known, they will doubtless speak for themselves. Meantime, there may be some workers who will regard Brumpt's arguments as conclusive, though there must be many others who—like the reviewer—will consider that "*E. dispar*" is merely another unwelcome addition to the already overlong list of synonyms of *E. histolytica*.

Clifford Dobell.

BACILLARY DYSENTERY.

VAN HOOF (L.). Au sujet d'une épidémie de dysenterie bacillaire dans le Mayombe (Congo belge). [**Epidemic of Bacillary Dysentery in Mayombe (Belgian Congo).**]—*Bull. Soc. Path. Exot.* 1925. July 8. Vol. 18. No. 7. pp. 532–541. [2 refs.]

Bacillary dysentery appears sporadically throughout the Congo, with occasional epidemic outbursts, often severe, determined by varying circumstances—such as famine or intercurrent disease, *e.g.*, trypanosomiasis. The author gives a clinical description of the

cases and the result of his bacteriological investigations. Hiss type was most often isolated, next in frequency Shiga, and Flexner type least. d'Hérelle's bacillus was also found. Though tried in a few cases only, a vaccine given by mouth proved satisfactory.

H. M. H.

SMITH (H. W.). **Report of an Outbreak of Bacillary Dysentery at the United States Naval Hospital, Canacao, P.I.**—*U.S. Nav. Med. Bull.* 1925. July. Vol. 23. No. 1. pp. 74–75.

An outbreak of bacillary dysentery commenced in February, 1925, lasting one month; there were in all 19 cases. The source of infection was thought to be tomatoes. The organism responsible was found to be the Flexner-Y bacillus. Antidysenteric serum administered early was followed by a serum rash in 13 cases; there were no deaths.

P. H. M–B.

BOLTON (J. Shaw) & MCGRATH (M. J.). **Asylum Dysentery and Allied Infections (Sixth Post-War Report).**—*The Eleventh Annual Report of the Board of Control for the Year 1924. Lunacy and Mental Deficiency.* pp. 120–122.

Were it not for the ever-present possibility that an epidemic might be started by some patient who had not agglutinated Flexner's bacillus when tested, but who was nevertheless a "carrier," it would be justifiable to investigate admissions only. The authors' report shows that their clinico-bacteriological methods now readily enable a threatened epidemic to be successfully coped with. During the year Flexner bacillus had been isolated from 4 cases. One of these affords a useful proof of the value of testing the agglutination reaction of the serum. This patient was found on admission to agglutinate Flexner bacillus 1/100. This enabled prompt isolation; later the bacillus was isolated from the stool.

H. M. H.

WATSON (G. A.) & AINSWORTH (C. G.). **Dysentery.**—*The Eleventh Annual Report of the Board of Control for the Year 1924. Lunacy and Mental Deficiency.* pp. 128–129.

All patients suffering from diarrhoea have their stools microscopically and bacteriologically investigated. Eleven cases of dysentery, Y strain of *B. dysenteriae* were thus diagnosed and isolated. Of 64 cases of diarrhoea, negative for dysentery bacilli, 54 appeared to be "simple," 4 flagellate, and 6 tuberculous in origin. Tests carried out in 125 cases for "clearing" purposes or for detection of carriers revealed no dysentery bacillus infection, nor was any typhoid or paratyphoid organism found. In order to obtain precise data concerning the ability of *B. dysenteriae* to survive without a host, in a dry state exposed to light, air, varying temperature, etc.—as is possessed by bacteria commonly cultured from dust and sweepings—cultures were made from saline washings from (1) lavatory and bathroom seats, catches, handles, ledges, skirtings and finger marks

on walls; (2) dust from skirtings and furniture, sweepings in ward and day room; (3) kitchen utensils; and (4) drinking water from taps. No dysentery organisms could be isolated.

H. M. H.

ROSENBAUM (S.). Zur Diagnostik und Therapie der Säuglingsruhr. [**Diagnosis and Treatment of Infantile Dysentery.**]—*Deut. Med. Woch.* 1925. Aug. 14. Vol. 51. No. 33. pp. 1358–1361. [25 refs.]

The author describes his experiences in the treatment, diagnosis, and prevention of infantile dysentery. They fall into line with the well-known and established general methods of treating such cases. Latterly he had found a dysentery bacillus vaccine, given subcutaneously to all children admitted to his clinic, useful in preventing dysentery.

H. M. H.

LIPPINCOTT (Leon S.). **A Case of Bacillary Dysentery contracted in the Laboratory.**—*Jl. Amer. Med. Assoc.* 1925. Sept. 19. Vol. 85. No. 12. p. 901.

On June 21, while doing agglutination tests to identify a recently-isolated culture of dysentery bacilli, the operator drew into her mouth through a pipette some of the broth culture. She at once washed out mouth with 95 per cent. alcohol, and then reported the accident. She was given chlorine water, 1 drachm 3-hourly, and mag. sulph. sat. sol. 2 drachms 2-hourly; diet to contain no uncooked food. The mag. sulph. was continued until one ounce had been taken; the chlorine water for 3 days. A vaccine from the culture being tested was given, beginning June 24. The culture proved to be Flexner type —both to agglutination and to sugar reactions. June 27 diarrhoea began—much mucus; blood present to microscope only. Culture of stool planted June 28 grew Flexner type bacilli. Chlorine water continued, and vaccine administered at 4-day intervals. Diarrhoea lasted 3 days, then ceased. On July 8 and July 17 cultures from faeces proved negative for dysentery bacilli. The treatment adopted probably determined the mild course and favourable outcome of the infection.

H. M. H.

ALIVISATOS (G. P.). Heilungsversuche bei Ruhr mit Hilfe eines per os gegebenen Schutzstoffes. [**Dysentery treated by a Vaccine given by Mouth.**]—*Deut. Med. Woch.* 1925. Oct. 16. Vol. 51. No. 42. pp. 1728–1731. With 2 text figs.

The cases were treated with a bacillary emulsion of Shiga-Strong-Flexner types given by mouth. The author concludes from his experience that a large percentage of cases of bacteriologically-proved dysentery and cases of clinical dysentery are favourably and rapidly influenced by this method of treatment. It shows a parallelism with specific serum therapy. No satisfactory explanation of the action of this remedy is yet forthcoming.

H. M. H.

HOSHI (Naotoshi). **On the Types and the Toxicities of the Bacilli of Child Dysentery in Manchuria.**—*Jl. Oriental Med.* 1925. Mar. Vol. 3. No. 1. English summary p. 45. [In Japanese.]

This paper embodies an investigation of infantile dysentery in Darien Hospital, and has special reference to the toxicity of several types of dysentery bacilli. The most prevalent type was the Y bacillus, which accounted for 44 per cent., Shiga's bacillus came next in prevalence, and then Hiss' fourth type. The general symptoms of infantile dysentery were somewhat slighter than in recent years. In the original Shiga type the mortality was nil, but in the third variety type it amounted to 29 per cent.

P. H. M–B.

KLUGH (George F.). **Bacteriological Findings in Acute Dysentery in Children.**—*Southern Med. Jl.* 1925. Oct. Vol. 18. No. 10. pp. 709–710.

A preliminary report of work done on acute dysentery in children with blood and mucus in stools. Smears were made from particles of bloody mucus and stained by Gram, which shows presence or absence of streptococci; and cultures, from particles of bloody mucus, were made on litmus lactose agar plates, 3 plates for each specimen. Colonies were then picked off for agglutination and further confirmatory study. Cultures from stools from normal infants are negative for dysentery bacilli.

Vaccination with repeated small doses of dysentery bacilli has been tried with apparently good preventive results. This seems to be the most feasible prophylaxis, especially during epidemics. For treatment antidysentery serum gives good results if used early. Theoretically lactose and acidophilus milk are ideal foods for dysentery patients.

The author found acute dysentery in children to be due to *Bacillus dysenteriae,* Flexner type; and to streptococci.

[The reviewer would point out that "purging" of any sort of case will show excess of streptococci in the stool; and that in the stools of healthy infants streptococci predominate.]

H. M. H.

DUMAS (J.), RAMON (G.) & B'LAL (Said). Les propriétés immunisantes de l'anatoxine dysentérique. [**The Immunizing Properties of the Dysenteric Anatoxin.**—*C. R. Acad. Sci.* 1925. July 27. Vol. 181. No. 4. pp. 198–199. [1 ref.]

Broth culture of Shiga bacillus incubated at 37° C. for 15 days, filtered through Chamberland F., and 0·01 cc. of filtrate injected into vein of 2 kilo weight rabbit killed the animal in 2 or 3 days. 4 cc. of formaldehyde (commercial solution 40 per cent.) was added to a litre of this toxin (filtrate) and the whole incubated at 37° C. for 40 hours. An intravenous injection of 10 cc. of this heated toxin had no effect on a rabbit. A number of rabbits were given subcutaneous injections of 0·5 cc. of this liquid and 8 days later 1 cc. 16 days later the animals tolerated 8 lethal doses of dysentery toxin injected intravenously; or 6 lethal doses of a 24-hours Shiga broth-culture, given subcutaneously. In the formol treated and incubated filtrate, dysentery toxin had been altered to anatoxin.

Horses were vaccinated, at 6 to 8 days interval, with progressive doses, 10 to 500 cc. of dysentery anatoxin. Horses tolerate with difficulty a dose of 50 cc. of dysentery toxin. The serum of horses treated with the anatoxin rapidly acquired antitoxic properties. Many titrations on the mouse showed that the anatoxin treated horses' serum in doses of $\frac{1}{200}$, $\frac{1}{300}$, $\frac{1}{400}$ of a cc., neutralized 6 lethal doses of toxin.

Three men were given a subcutaneous injection of 1 cc. of anatoxin. No general, and very slight local, reaction followed. Fifteen days later the serum of these persons neutralized, respectively, 1 to 3 lethal doses for the rabbit. Under like conditions normal human serum was without effect. Dysentery anatoxin therefore caused the production of immune antibodies in rabbit, horse, and man. Protective vaccination of man with dysentery anatoxin is thus envisaged.

H. M. H.

i. LESBRE (Ph.). Immunisation expérimentale par anatoxines contre le bacille de Shiga. **Experimental Immunization against Shiga's Bacillus by Anatoxins.** *C.R. Soc. Biol.* 1925. Aug. 14. Vol. 93. No. 27. pp. 612–613. [2 refs.]

ii. . Bactériophage et anatoxine dans la vaccination anti-dysentérique par voie buccale. **Bacteriophage and Anatoxin in Vaccination against Dysentery by the Mouth.** *Ibid.* pp. 614–615.

i. From the results of experimental work on the immunization of rabbits by formol-treated Shiga bacillus anatoxin, injected subcutaneously or given by mouth, the author feels justified in claiming that the immunization of man against bacillary dysentery is brought nearer, and, in particular, the solution of the problem of vaccination by the oral route.

ii. The bacteriophage immunizes satisfactorily against the less toxic Flexner bacillus; bacteriophagic lysis differs from anatoxin in that it exhibits the products of bacillary destruction only, while the anatoxin carries as well products of bacillary secretion set free during its preparation. The high immunizing value of anatoxin is due to its preponderant content of these exotoxins.

H. M. H.

PERRY (H. Marrian) & COPPINGER (C. J.). **Observations on the Employment of Anaerobically-Grown *Bacillus dysenteriae* Shiga as a Vaccine.**—*Jl. Roy. Army Med. Corps.* 1925. Oct. Vol. 45. No. 4. pp. 241–250. With 2 charts in text. [5 refs.]

This paper cannot be fairly summarized. The authors conclude from their experiments, that :—

(1) Suspensions of *B. dysenteriae* Shiga, anaerobically cultured, can be inoculated into man and animals in large doses without causing excessive local or general reaction.

(2) Such inoculations produce in blood agglutinating and complement-fixing antibodies to an extent comparable with that following inoculation of Shiga bacilli aerobically grown.

(3) There is some evidence that an animal inoculated with suspension of anaerobically-grown organisms can withstand doses of suspension of aerobically-grown bacilli which were fatal to unprotected animals.

(4) A mixed vaccine of bacilli of the mannite-fermenting dysentery group, together with anaerobically-grown Shiga bacilli, can be administered to men without causing reaction greater than that following typhoid-paratyphoid inoculation; and produces agglutinins for both types of organism.

H. M. H.

BOKU (Shokun). **On the Proportion of Diagnostic Serum for *Bacillus dysenteriae* Shiga.**—*Mitt. a.d. Med. Akad. z. Keijō.* 1925. Vol. 8. No. 4. pp. 33–55. With 6 text figs. [42 refs.]

1. In order to get a special agglutinating serum from rabbits for Shiga bacillus a heated bacillus must be used.
2. Shiga bacillus heated under 65° C. is toxic to rabbits.
3. A strongly agglutinating serum can be got with bacilli heated to 75° C., even with small doses: but rabbits can stand even larger doses of 85° C. heated bacilli.
4. Immunization is best obtained with bacilli heated to 100° C. This vaccine given intravenously is only slightly toxic, and produces a strongly agglutinating serum within a short time.
5. Standardization of injection dosage is difficult, as different rabbits show varying agglutinating powers.
6. Rabbits' serum with heated bacillus is best used for diagnostic purposes, as it gives negative reaction with other intestinal bacilli.
7. With serum of rabbits immunized as above unheated bacillus should be used.

The virus for immunizing was prepared as follows: 24 hours' incubation of Shiga bacillus on agar; from this take 10 mgm. of bacteria and add 10 cc. of 0·05 gm. carbolic acid. This gives solution 1. Further solutions are made by heating the first bacterial emulsion without carbolic acid, to 65° C. (2nd sol.), 75° C. (3rd sol.), 85° C. (4th sol.) and 100° C. (5th sol.) in water bath for one hour; cool and add 0·05 gm. carbolic acid. These several solutions were injected into the vena auricularis posterior of the rabbit.

H. M. H.

PRZESMYCKI (F.). Z badań nad czerwonka. [**The Standardization of Dysentery Sera.**—*Medycyna Doświadczalna i Społeczna.* Warsaw. 1925. July–Aug. Vol. 5. No. 1–2. pp. 18–41. [55 refs.] German summary p. 41.

This research was carried out at the Warsaw Serum Institute, at the instigation of the Health Committee of the League of Nations. The production of Shiga-Kruse toxin was investigated, and found to originate with the nutrient medium changing from acid to alkaline. The toxin appeared to be single. No division into exo-toxin (nerve poison) and endo-toxin (intestinal poison) was established. Immunizing horses with young or old cultures produced the same quality serum. The dysentery toxin is combined with the serum according to a definite rule of multiple proportion. The combining power of the several fluid toxins was generally the same. Dried toxin had a higher combining power. Titration of the bactericidal substance gave varying values. WAHL's method was employed for titrating the antitoxin *in vitro*.

H. M. H.

CALALB (G.). Retour des bacilles dysentériques atypiques aux types dysentériques vrais, après passage par l'organisme. [**Return of Atypical to True Dysentery Bacilli after Animal Passage.**]—*C.R. Soc. Biol.* 1925. Aug. 14. Vol. 93. No. 27. pp. 729–730. [1 ref.]

The author has previously shown that para-dysenteric bacilli, recovered from the stools of old dysentery patients after true dysentery bacilli had disappeared, were not agglutinated by anti-Shiga and anti-Flexner serums; on the other hand, used as antigens a serum can be obtained which agglutinates them as well as the Shiga-Flexner, or the Flexner group alone. After intraperitoneal passage through the rabbit it was found that these paradysenteric bacilli, besides regaining, in some cases, the power to ferment all the sugars, were now all agglutinated by anti-Shiga serum; and had lost completely the property of being agglutinated by serums for which they had acted as antigens, and by which they had been agglutinated before the rabbit passage. Bacteriological investigation, before the experiments, showed the rabbits' faeces to be free from dysentery or para-dysenteric bacilli.

H. M. H.

BURGDORF (Richard). Ueber Normalagglutinine für Ruhr- und andere Bazillen. [**Normal Agglutinins for Dysentery and other Bacilli.**]—*Cent. f. Bakt.* I. Abt. Orig. 1925. Aug. 1. Vol. 95. No. 7/8. pp. 417–423. With 2 charts in text. [6 refs.]

A purely bacteriological paper describing, and discussing, the variations in agglutination power of human blood serums against dysentery and pseudo-dysentery bacilli; the author considers much further research on these variations to be necessary.

H. M. H.

ADACHI (Kiyohisa) & KUBO (Tadawo). [**Studies on Antidysenteric Vaccine.**]—*Tokyo Iji-Shinshi* (*Tokyo Med. News*). 1925. May. No. 2419. [Summarized in *Japan Med. World.* 1925. July 15. Vol. 5. No. 7. p. 184.]

Shiga bacillus, which gave severe reaction, was heated over a water bath for one hour. Flexner, Hiss and Okhara strains were all treated after the routine method of preparing sensitized vaccine. The above four lots were mixed so as to obtain a vaccine having bacterial content 1 mgm. to 1 cc. (0·25 of each strain in 1 cc.). The authors claim good results from this vaccine.

H. M. H.

KASUGA (Kenzo) & GOTO (Ki). [**An Endo's Fuchsin Agar on which the Dysentery Baccillus can be cultivated.**]—*Gun-I-Dan Zasshi* (*Jl. Japan Military Med. Assoc.*). 1924. June. No. 133. [Summarized in *Japan Med. World.* 1925. June 15. Vol. 5. No. 6. p. 161.]

This medium is claimed as a good one for the cultivation of both dysentery and typhoid bacilli.

Agar powder ...	30·0	Refined meat extracts (Arrow)	15·0
Teruuchi's peptone ...	25·0	Anhydrous sodium bicarbonate (enough to neutralize peptone)	0·7
Table salt	4·1	Powdered lactose	20·0
Grübler's fuchsin ...	0·3	Anhydrous sodium sulphite...	1·75

First grind powdered agar with meat extract, sodium bicarbonate, and table salt: heat mxture at 50° C., for 8-10 hours, until completely dry. Mix and grind lactose and pepsin, and add them to first mixture. Finally add peptone and anhydrous sodium sulphite and mix well: put up in ampoules.

H. M. H.

Mixed and Unclassed Dysentery.

Teodosijevits. Kalziumbehandlung der Dysenterie. [**Calcium Treatment of Dysentery.**] –*Deut. Med. Woch.* 1925. Sept. 25. Vol. 51. No. 39. p. 1620.

In the district of Valjevo (Serbia), summer and autumn often bring epidemics of dysentery of varying extent and severity. The author had found various serums and drugs useless to lower its mortality. Calcium chloride solution given intravenously surpassed all other remedies and changed, at a stroke, the whole picture of the disease. From its use cure was certain and lasting and rapid. As samples of its action, details of three cases are given. They showed prostration, high fever, very frequent blood and mucous stools, tenesmus and colic. 10 cc. of a 10 per cent. solution of calcium chloride was injected intravenously morning and evening, together with a subcutaneous injection of morphia. Cessation of symptoms and convalescence with no relapse followed rapidly. Its use in other diarrhoeas is advocated.

H. M. H.

Peruzzi (Mario). La Vibriothrix Zeylanica (Castellani) nei dissenterici di Pola. [*Vibriothrix zeylanica* **in Dysenteric Patients at Pola.**] –*Ann. di Med. Nav. e Colon.* 1925. May–June. Year 31. Vol. 1. No. 5–6. pp. 255–256.

This organism was isolated by the author from the dysenteric stools of a soldier. It was cultivable in blood-broth and showed much pleomorphism—undulating forms with a narrowed extremity, spirillar and spirochaetal forms, branching forms, and others pyriform or spherical. Inoculation in large doses intraperitoneally into a guineapig produced fatal general peritonitis in 30 hours; smaller doses led to the establishment of immunity reactions 10 days after the first injection, Widal, Pfeiffer, and Bordet-Gengou reactions all being obtained. It is designated a Vibriothrix for the following reasons: 1. On account of the branching mycelial growth with spore-formation it is allied to the Fungi Imperfecti. 2. Its ready cultivability and its power of acting as an antigen and producing agglutination reactions are bacterial characters. 3. Spirochaetal forms and the evidence of differentiation in the nucleus of binary fission and chromidial fragmentation are suggestive of protozoal nature.

More detailed work upon this organism is to be published later.

H. Harold Scott.

Kurup (P. K.). **A Case of Choleraic Dysentery.** –*Indian Med. Gaz.* 1925. July. Vol. 60. No. 7. p. 325.

A clinical account of an algid cholera-like case, ending fatally. No post-mortem examination. The author considered the bloody stools strong evidence against cholera. Ten days previously 3 cases of cholera

had been reported in the place whence came the patient. The Editor, *Indian Medical Gazette*, appends a note—"possibly a fulminating case of Shiga bacillus infection."

H. M. H.

MUELLER (Ernst Adolf). Ein Beitrag zur Frage der Dysenteriebehandlung. [**Treatment of Dysentery.**]—*Med. Klin.* 1925. Aug. 21. Vol. 21. No. 34. (1080). pp. 1270–1271. [18 refs.]

An account of the cases of dysentery, in the author's medical care, occurring among German, Austrian and Turkish prisoners of war in the camp at Tel el Kebir, Egypt, in 1919. A painstaking paper which discloses nothing novel.

H. M. H.

CALLINDER (George N.). **The Cytological Diagnosis of Dysenteric Conditions and its Application in the Military Service.** *Milit. Surgeon.* 1925. June. Vol. 56. No. 6. pp. 686–699. With 1 plate. [16 refs.]

The methods of cytological diagnosis in the dysenteries on the lines worked out by HAUGHWOUT are discussed. The application of these methods is especially suited to army conditions.

P. H. M–B.

PETZETAKIS (M.). Coccidiose intestinale aiguë guérie rapidement par l'émétine. **Acute Intestinal Coccidiosis rapidly cured by Emetine.**—*Arch. des Malad. de l'Appareil Digestif.* 1925. Mar. Vol. 15. No. 3. pp. 264–266; also in *Rev. Méd. et Hyg. Trop.* 1925. May–June. Vol. 17. No. 3. pp. 139–141.

Two almost identical reports of a case of infection with *Isospora hominis*, apparently in Alexandria. Vague intestinal disturbances were followed by acute dysenteric symptoms, but without visible blood in the glairy stools. Intramuscular injections of emetine gave relief speedily.

A. Alcock.

BAUMANN (E. D.). De dysenterie te Nijmegen in 1736.—*Nederl. Tijdschr. v. Geneesk.* 1925. Aug. 1. Year 69. 2nd Half. No. 5. pp. 605–619. [39 refs.]

HOSHI (Naotoshi). [On the Types and the Toxicity of Bacillus of Child Dysentery in Manchuria.]—*Manshyu Igaku Zasshi* (*Jl. of Manchurian Med. Soc.*). 1925. Mar. Vol. 3. No. 1. [Summarized in *Japan Med. World.* 1925. Aug. 15. Vol. 5. No. 8. p. 220.]

KOHNO (Yuji). [Clinical Bacteriological Studies on Dysenteric Cases.]—*Iji Shimbun* (*Med. News*). 1925. June. No. 1165. [Summarized in *Japan Med. World.* 1925. Aug. 15. Vol. 5. No. 8. p. 218.]

PETRIDIS (Pavlos A.). Un cas d'abcès du foie tropical à forme apyrétique.—*Rev. Méd. et Hyg. Trop.* 1925. July–Aug. Vol. 17. No. 4. pp. 173–184.

——. Abcès sus-diaphragmatique droit consécutif à la rupture lente dans la plèvre correspondante d'un abcès du foie tropical siégeant à la face convexe du lobe droit.—*Ibid.* Sept.–Oct. No. 5. pp. 208–212.

WATANABE (Koohei). [On the Mutation of the Dysentery Bacillus.]—*Eiseigaku Densenbyogaku Zasshi* (*Jl. Hyg. & Infect. Dis.*). 1925. Feb. Vol. 20. No. 4. [Summarized in *Japan Med. World.* 1925. Aug. 15. Vol. 5. No. 8. pp. 225–226.]

SPRUE.

ASHFORD (Bailey K.). **Sprue.**—*Ann. Clin. Med.* 1925. July. Vol. 4. No. 1. pp. 13–20.

While sprue is primarily a tropical disease, it is becoming more apparent that it is spreading in the southern parts of the United States, as well as in China and Korea.

The present paper is founded upon the evidence and clinical impressions derived from 2,500 cases. Sprue is considered to be one of the most marked examples of a disordered mechanism which makes the colonization of a specific organism the *Monilia psilosis*—possible. After a restatement of the author's well-known views on the etiology it is recorded that, in a small number of examinations of duodenal secretion recovered by the Einhorn tube from undoubted cases of sprue, half revealed no lipase, while the other showed a well-marked insufficiency. In treatment the diet in the majority of cases should exclude all cereal foods and their derivatives such as would enrich the intestinal medium for *Monilia psilosis*. The value of calcium salts, first exploited by charlatans in the form of cuttlefish bone and powdered crab's eyes, was soon proved by the author who, independently of SCOTT, combined it with parathyroid. He believes this to be of definite benefit, but the *modus operandi* is by no means settled.

Positive benefit has followed the use of *Monilia psilosis* vaccines in the vast majority of cases. In order to subject the vaccine therapy to a severe test, it became necessary to employ vaccines only, to withhold all drugs, and encourage an excess of fats, cereals and sugar. Of 15 such persons, 10 had very severe or cachectic types of sprue. Two of these cases were cured, the symptoms disappearing in 81 days. Three others were liberated of all evidences of sprue in an average of 65 days, but have not gained in weight. Of the remainder 4 were improved and 1 is dead. Injections were given, as a rule once weekly, of a 1 per cent. sediment of killed culture of *Monilia psilosis* suspended in normal salt solution in an ascending scale of dose from 0·1–1 cc. Eight injections were required as a rule. In a fair proportion of those inoculated there is generally noted on the second or third day weakness, increase of meteorism, diarrhoea, and an exacerbation of sore tongue.

While cures of sprue apparently occur from diet alone, and even at times follow quite inexplicable procedures, prolonged observation seems to justify the employment of specific vaccines. Sprue is no longer the necessarily fatal disease it was formerly considered to be. Considering all grades of the disease which exist in the Antilles, one should not expect a mortality of over 5 per cent.

P. H. Manson-Bahr.

JOHNSON (Gertrude) & BREIDIGAIN (F. T.). **Tropical Sprue in a Child Six Years of Age. With Isolation of Monilia from Patient and Tissues of Inoculated Animal.** *Amer. Jl. Med. Sci.* 1925. Sept. Vol. 170. No. 3. pp. 364–371. With 4 figs. [6 refs.]

The authors record the clinical history of a child of six years of age who, after return from India, was subject to diarrhoea and intestinal disturbances. At a "famous school of tropical medicine" her illness was diagnosed as Hirschsprung's disease and later in London as tubercular enteritis. On admission to the hospital under the

authors' care her case was diagnosed without difficulty as sprue, on account of the typical appearance of the tongue, aphthae and stools. In the latter *Monilia psilosis* was demonstrated without difficulty, and the same organism was cultured from the faeces and tongue. The culture failed to be agglutinated by the patient's serum, but a positive complement-fixation was obtained with an antigen isolated from the stool and tongue scrapings. From a rabbit injected with 1 cc. of a living suspension of the organism which died with multiple pyaemic abscesses in both kidneys the organism was recovered. Treatment consisted of light tonic hydrotherapy and cleansing enemas, followed by a liquid culture of *B. bulgaricus* and *B. acidophilus*, to be retained. Her dietary was confined to acidophilus buttermilk and bananas. Improvement rapidly commenced and was completed by a course of injections with autogenous vaccine, which occasioned localized abscesses at the site of injection. Her weight increased from 27 to 42 lbs., and gradually, within six months, all symptoms disappeared, the improvement being attributed to the vaccine treatment.

P. H. M–B.

HORNADAY (W. A.). **Sprue—with Report of a Case.**—*U. S. Nav. Med. Bull.* 1925. Aug. Vol. 23. No. 2. pp. 106–111.

An account of a case of sprue which originated in Porto Rico, in which three relapses occurred. Recovery eventually took place on a milk diet aided by calcium lactate and parathyroid therapy. The *Monilia psilosis* was isolated during the primary attack, but not subsequently.

P. H. M–B.

THAYSEN (Th. E. Hess). **A Disease resembling Tropical Sprue originating in Denmark.**—*Acta Medica Scandinavica.* 1925. Vol. 42. No. 3–4. pp. 197–212. [12 refs.]

A year ago the author demonstrated in Copenhagen a case of disease which greatly resembled sprue in its general clinical features, as well as in the loss of fat and in the high fat-content of the faeces; but the patient had never been in the tropics. Since then he has investigated four other cases, and can state that sprue, or a sprue-like condition, occurs in Denmark in patients who have never been beyond its confines.

He recognizes the following three disease forms: (1) Indian white diarrhoea=fatty diarrhoea; (2) sprue=fatty diarrhoea+stomatitis; (3) Psilosis linguae=Ceylon sore mouth=stomatitis aphthosa.

The first case here reported was in a manager of a dairy, aged 64, who suffered from diarrhoea, with the passage of 5–6 watery, white, voluminous and fermented motions in the 24 hours. On a test diet the total fat consumed was 190 gm., the fat lost 13 per cent. Nitrogen consumed was 30·8 gm., nitrogen excreted 3·3 gm., nitrogen lost 11 per cent.

The second patient, a clerk, 32 years of age, had never been out of Denmark. In childhood he had suffered from osteomyelitis, and at 15 was operated for appendicitis, after which a troublesome diarrhoea commenced, and has persisted ever since. From an early date he had been troubled with stomatitis; an interval of 10 years elapsed before

the onset of the diarrhoea. The motions were sprue-like ; the fat-loss being 29 per cent., nitrogen loss 12 per cent.

The third case was in a tailor, aged 49. Diarrhoea had, apparently, been noted from boyhood, and for 8 years had been so severe as to call for medical attention. During an acute attack tetany had been noted. Recurrent attacks of stomatitis were accompanied by degenerative blood changes of a pernicious character. The fat-content of the faeces was 32 per cent.

It will be noted that both these patients had suffered from periodic recurrences of diarrhoea for many years before they developed the condition resembling sprue.

The fourth case was in a ship's engineer, aged 54, who had not been in the tropics for 26 years, but had been engaged almost continuously in Greenland. Stomatitis commenced 2 years ago, though the diarrhoea had lasted only 3 months. The stools (3 to 4 a day) were typical in appearance. The faeces were bulky, fat-loss being 60 per cent., nitrogen-loss 25 per cent. ; there was slight anaemia. Interference with pancreatic function was suggested by the presence of glycosuria.

[The clinical histories of the patients recorded in this paper are summarized at a greater length than is customary mainly on account of the importance of this communication. Many points may be emphasized against the acceptance of the diagnosis of true tropical sprue in all the cases recorded. The weights of the stools passed are, with the exception of the 4th (6–12 ozs.), small for true sprue. The length of the duration of the diarrhoea, unaccompanied by great and progressive emaciation, is another important point. The almost total absence of accompanying anaemia appears remarkable. The fourth was a syphilitic, while the concurrent glycosuria would point to the pancreas as the primary factor. Glycosuria in true sprue is undoubtedly very exceptional.]

P. H. M–B.

SLEEPING SICKNESS.

KINGHORN (Allan). **Human Trypanosomiasis in the Luangwa Valley, Northern Rhodesia.**—*Ann. Trop. Med. & Parasit.* 1925. Sept. 30. Vol. 19. No. 3. pp. 281–300.

This paper opens with a discussion of the physical aspects of the Luangwa Valley, of the distribution of game and fly, and of the history of sleeping sickness in the Valley.

The observations now dealt with were made during 1913 and the early part of 1914, and after the conclusion of the War from 1920 onwards. Kinghorn relied on gland palpation and puncture as a means of diagnosis, and only departed from this method in exceptional cases and for special reasons, *e.g.*, where the illness appeared clinically to be sleeping sickness, but no palpable glands were found.

Sleeping sickness was found to be very widely distributed in Petauke, Serenje, Fort Jameson, Lundazi, Mpika and Chinsali portions of the Valley. It is, however, comparatively rare, as during 1913-14 only 19 cases were found amongst 23,113 natives examined, and in 1921 only two cases amongst 5,947. Evidence is produced that there is a general tendency of the disease to remain stationary over a period of years. A very striking feature of the infection is the remarkably sporadic manner in which it occurs. Not only are the cases found in villages widely separated, but they are also usually found occurring singly, and cases in the same village may be separated by an interval of years. This fact is clearly brought out in the tables. Kinghorn finds in this peculiar distribution support for the view that the human and game trypanosomes are one and the same parasite, and that man is extraordinarily resistant to infection by it.

While the normal incidence of the infection is as mentioned above, exacerbations have from time to time been observed in localized areas of the Valley, but these, after the lapse of a few years, have always ended spontaneously. The most pronounced instance of an exacerbation was the one which started early in 1918 in the northern end of the Lundazi sub-district. In May, 1920, the Native Commissioner reported that since the commencement of this outbreak 131 deaths had occurred from what appeared to be sleeping sickness amongst an adult population estimated at 1,455. Kinghorn notes that plague appeared in this district at the end of 1917, and was not stamped out until 1919. This coincidence was probably quite fortuitous except that many villages were burned and the natives forced to build temporary quarters in the bush, which, of course, brought them into closer and more continuous contact with fly than is usually the case. In a table the author gives the results of an examination of the natives in this district in the years 1913, and 1920 to 1925. In 1913, 0·06 per cent. were found to be infected; in 1920, 0·43 per cent.; in 1921, 0·32 per cent.; and during the succeeding three years the number gradually fell to 0·04 per cent. Kinghorn is of the opinion that epidemics of this sort are usually due to the superimposition of a man-fly-man cycle of transmission of the parasite on the more ordinary game-fly-man cycle, and that the occurrence of this is often hastened by some change in the habits of the natives.

The next section of the report gives an account of the disease in human beings. The incubation period is short, probably between one and two weeks. At first the only symptom is fever with its concomitants. This is followed by adenitis, progressive emaciation,

oedemata of the extremities and face, protuberant abdomen, diarrhoea, anaemia, tremors, inco-ordination, mental hebetude, and somnolence deepening into coma. In untreated cases the average duration of the disease is from three to six months. Only occasionally may a case live from 10 to 12 months, and only once in Kinghorn's experience has that period been exceeded.

Evidence is produced to show that the disease is decidedly one of adolescence and adult life. The author has never seen a case in a young child, and only comparatively rarely under the age of about 15.

In the following section further information is given regarding the fate of 38 cases treated by KLEINE and FISCHER with "Bayer 205." Only five cases were alive in August, 1924; these were examined by Kinghorn at that time and again in the spring of the present year. All appeared to be in perfect health and showed no parasites in the blood stream. Kinghorn disagrees with the claim of KLEINE'S Commission that "if in districts infected with sleeping sickness all suspected natives receive treatment . . . the source of infection for the tsetses will gradually disappear and in time the disease must die." This claim is based on the assumption that man is the only reservoir of the virus and that the game is negligible—an assumption which Kinghorn cannot admit.

With reference to prophylaxis the author states it must be recognized that no assistance can be expected from the natives for any measure designed either to combat a specific infected area or generally to improve the sanitation of the villages. Very few Europeans travel in the Valley now, and the natives have remained under their ancient tribal beliefs and treat European ideas of the etiology of diseases and the methods to be adopted in treating them with undoubted, if unexpressed, disbelief. The general attitude of the native is one of passive resistance which can only be overcome by a certain amount of compulsion, and when force has to be employed results are usually unsatisfactory. With the increase of education, this attitude may be modified, but it will necessarily be a very slow process. Something might be done by arrangement with the various missions to have schools in the Valley, and by giving the teachers instruction in the essential facts of the etiology of sleeping sickness and other infections.

Sleeping sickness ordinarily is one of the less important causes of death in the Valley, and Kinghorn doubts whether it is incumbent on the Government to provide special facilities for treatment beyond those which already exist in the various hospitals. It is advisable to keep on the statute book the sleeping sickness regulations, not with any idea of interfering with the natives, but chiefly for the power they confer of regulating the movements of Europeans.

W. Yorke.

BEVEN (J. Osmonde). **Trypanosomiasis in Kenya Colony. A Report on a Sleeping Sickness and Tsetse Fly Survey of the Nyanza Province.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1925. Feb. 19. Vol. 18. No. 8. pp. 439–454. With 1 map in text.

The author describes the results of a survey for sleeping sickness made in 1921 of the north-eastern shores of Lake Victoria from the Uganda boundary to the Tanganyika boundary at Mwinene Bay, as well as of the principal rivers flowing into the lake between these limits.

Glossina palpalis was the common species throughout the country examined; *G. pallidipes* was found in two localities, viz., in the dry thorn bush along the south bank of the Kuja River some distance from the water and in similar country in Kasigunga; and *G. fusca* was met with in five places.

Cases of sleeping sickness were found in the following places: Usaki, 2; Karunga, 1; Kadem, 1; Kaniamkago, 1; Kabwoch, 1; Gwasi, 1; Karachonya, 41; Nyakach, 8; Kadimu, including Mageta Island, 45; Alego, 4; Asembo, 2.

The next section consists of notes on some of the locations visited; and the author then passes to a consideration of the spread of sleeping sickness. The disease, apart from single isolated cases, was found fairly widespread and increasing in four areas, viz.: the Miriu river, Homa Point, Mageta Island, and to a much lesser extent in Kadimu. In none of these does sitatunga occur. The paper closes with certain recommendations for dealing with the situation. W. Y.

SWYNNERTON (C. F. M.). **The Evidence as Regards the Game in the Outbreak of Human Trypanosomiasis near Mwanza.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1925. Mar. 19 & May 21. Vol. 19. Nos. 1 & 2. pp. 70–80. [4 refs.]

This paper is a rejoinder to that of DAVEY (this *Bulletin*, Vol. 21, p. 748).

The following summary is given:—

"1. *Origin of the Outbreak.*—No fresh light has been thrown on the origin of the outbreak. The alternatives remain as they were in 1922, and it is at present not more probable that infection was derived from game than that it was introduced with a human infect. The evidence available is to the effect that the outbreak, as an appreciable outbreak, is of recent occurrence.

"2. *Method of Spread.*—Cyclical infection appears likely to have been at play; but even here man is indicated as a probable infector of the fly.

"3. *Game Distribution.*—The position in 1922 was exactly as it was described by me at the time (1923, p. 324), excepting that the arrow in my map, between Kilalo and Ngasamo, indicating a game movement and a good deal of game abundance, should, I find, have been extended unbrokenly to Mtukuza. Observations made outside the area, or at a date when it has been to all intents and purposes a game reserve for 18 months, are irrelevant.

"The position described in 1922 and the fact that it was preceded by very heavy slaughter of game were matters of observation and investigation, and the facts have been confirmed by others. The belief that the oft-urged experiment in game destruction has been practically carried out in the area was a statement of opinion. It may be correct or it may be mistaken.

"4. *Source of Infections.*—The importance of infected man as a source of infection of the fly has probably been very greatly under-estimated. Actual evidence against the game as a reservoir of Rhodesian sleeping sickness is still confined to the resemblance between the trypanosomes, and, as regards this theory, the laboratory analogy relied on by Dr. DUKE. The game may be a reservoir, but, especially in view of TAUTE's experiments, that needs to be proved.

"5. *Inference from Discoveries of T. rhodesiense Infection.*—The mere fact of the occurrence of an outbreak is not 'A link in a chain of evidence that wherever game infected with the *brucei-type* of trypanosome, fly of the *morsitans* group and man are brought into sufficiently close contact' cases of human sleeping sickness will arise.

"Many outbreaks, perhaps most, possibly all, may be originated by infected human beings. The evidence must be closely sifted and the probabilities separately arrived at for every outbreak and case. There has been such continuous movement of people between infected and uninfected areas during and since the war, that it will be surprising if cases and outbreaks of *man*-introduced infection are not found to be ubiquitous.

"6. *Effect of the Measures Adopted.*—Most of the figures of sick for 1923 came from country which had been unsearched or in which control was otherwise incomplete in 1922.

"The Sultanates most fully searched and brought under control in 1922 showed the figures 2, 0 and 0 in 1923. This, it is believed by those best in a position to judge, was a true indicant of the success of the measures taken.

"7. *The Effect of the Prevalence of the 'One-Family' Bush Village.*—Owing to the small size of such villages the feral conditions essential to the presence of tsetse in numbers exist right up to them and to their very small fields, and the inhabitants, sick and well, are attended by the flies in all their occupations. A maximum number of flies are thus laid open to infection, and a maximum number of healthy people. Thus, with village to village intercourse also considerable, epidemic is likely to be facilitated by a prevalence of the small village."

W. Y.

KELLERSBERGER (E. R.). **Note on a Case of Sleeping Sickness in a Child Three Weeks Old.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1925. Mar. 19 & May 21. Vol. 19. Nos. 1 & 2. pp. 81–83.

The author, in Katanga, was called on September 25, 1924, to see a baby boy 10 days old with high fever and a very large spleen. A diagnosis of malaria was made, although the blood was negative, and an injection of quinine was given. On October 9 he again saw the child and examination of thick blood films revealed the presence of numerous trypanosomes. The mother was then examined and some soft glands found; these on puncture showed trypanosomes.

The mode of infection of the child is considered, and apparently there were three possibilities, viz., intrauterine infection, through the milk, and through mosquito bites. It was impossible to reach any definite conclusion which of these three alternatives was responsible for the infection.

W. Y.

WALRAVENS (P.). Traitement de la maladie du sommeil. [**Treatment of Sleeping Sickness.**]—*Bull. Soc. Path. Exot.* 1925. Apr. 8. Vol. 18. No. 4. pp. 312–316.

Although there is evidence that "Bayer 205" is of considerable value in the treatment of early cases of sleeping sickness, the results obtained in advanced cases of the disease, and especially those exhibiting nervous signs, are much less satisfactory. In view of this the author has investigated the effect of "Bayer 205" when combined with atoxyl, emetic or neosalvarsan in advanced cases. The exact method of treatment is described; lumbar puncture was made before treatment, and one month and four months, respectively, after treatment: the results are set forth in a table.

The conclusions are:—

1. Of six patients treated with atoxyl-Bayer one appeared to be cured, one improved but could not be followed up, one was probably

cured, one improved but should be observed further, and in two the disease did not seem to be arrested.

2. Of five patients treated with atoxyl-emetic-Bayer, two in whom the spinal fluid was hardly changed before treatment were probably cured, one in whom the spinal fluid was markedly changed appeared to be cured, and one with very pronounced changes in the spinal fluid improved at first, but relapsed later.

3. Of three patients treated with Bayer–emetic, and in whom the spinal fluid showed moderate changes, one got worse, but two are probably cured.

4. Of two patients treated with Bayer–neosalvarsan, one appeared to be cured, and the other got worse.

5. Of three patients treated with Bayer alone—one with normal spinal fluid, and two with a spinal fluid slightly altered—all appeared to be cured.

Summarizing these results, it appears that the combination of antimony with "Bayer 205," with or without the addition of arsenic, has the best action on the nervous stage of human trypanosomiasis. The persistence of the peripheral sterilization is noted.

W. Y.

TANON (L.) & JAMOT (E.). Essais de traitement de la maladie du sommeil au Cameroun par le "Bayer 205." [**Treatment of Sleeping Sickness in Cameroon by "Bayer 205."**]—*Rev. Méd. et Hyg. Trop.* 1925. May–June. Vol. 17. No. 3. pp. 97–115.

The therapeutic value of "Bayer 205" was tested in 39 cases of sleeping sickness in Cameroon; the patients were kept under daily observation for three months after treatment and subsequently less regularly up to 9 months. The cases were divided into four groups:—

1. Those presenting all the signs of the first period, with a normal spinal fluid.

2. Those with a slight degree of meningeal disturbance indicated by a little lymphocytosis without trypanosomes—commencement of the second stage.

3. Those with marked lymphocytosis with or without parasites—second stage.

4. Those exhibiting emaciation, cachexia, somnolence and nervous troubles—third stage.

Details are given of all the cases treated.

Summarizing the results, it was found that "Bayer 205" was a good trypanocide, but that it was attended with the danger of albuminuria. It is not superior to atoxyl, which causes the disappearance of trypanosomes within an equal time. The drug has an irritating effect on the renal epithelium and the albuminuria which it produces is not always transient; it is accompanied by definite histological changes in the renal epithelium and may lead to anuria.

The authors ask whether, even when the albuminuria disappears, the kidneys may not be left in a damaged state and the condition finally terminate in a nephritis. They do not, however, consider that "Bayer 205" should be rejected as a remedy for *T. gambiense* infections, but insist that it must be used with caution.

With regard to the question whether the drug has a curative action, the authors state that it would be premature to offer an opinion; sleeping sickness develops slowly and one can only speak definitely regarding the value of any drug after a lapse of two or three years. But from the information available they believe that it has not the

curative action which is claimed for it, because it has no effect on the principal lesion, that of the meninges. The meningeal reaction is not influenced by the drug, and the authors adhere to the principle that a drug can only be considered capable of curing sleeping sickness when it causes the meningeal reaction to disappear. In the authors' series of cases all those who were in the first stage of the disease can be considered to be cured, and for the purpose of treating such cases atoxyl is a most suitable drug. "Bayer 205," has, however, one great advantage, and that is that it is valuable in *T. rhodesiense* infections.

W. Y.

FISCHER (W.). Die Schlafkrankheit auf Fernando Poo. Erfahrungen mit der Germaninbehandlung. [**Sleeping Sickness in Fernando Po. Treatment by Germanin.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. June 1. Vol. 29. No. 6. pp. 255–264. [4 refs.].

The author visited the island of Fernando Po and treated a number of cases of sleeping sickness there between November, 1923, and March, 1924.

Sleeping sickness in this Island was first studied in 1909; it is now widely spread and *Glossina palpalis* is ubiquitous. In a short time Fischer found 239 native cases by blood examination; in addition almost an equal number of cases diagnosed clinically were treated, but in the absence of a microscopic diagnosis these are omitted from the statistics. Eight white patients—1 German, 2 Spaniards, 4 Portuguese and 1 English woman—were also treated.

A detailed account of the disease and its treatment is given in the case of two of the Europeans. Of the 247 cases diagnosed microscopically, 10 disappeared after the diagnosis had been made and were untreated, 21 had only a single injection, and 28 only 2 injections. Finally, 10 cases came for treatment only a few days before the author left and so cannot be included in considering the results. There thus remained 178 cases systematically treated. A few of these had been previously treated with arsenic, but the majority were untreated. The same plan was followed as in the Congo, viz., 1 gm. of Bayer intravenously on the 1st, 3rd and 10th or 13th days; in bad cases this course was repeated after a month's interval. In two cases in the third stage trypanosomes reappeared in the blood 33 days after the third injection, and in one case in the second stage 30 days after the third injection. In view of this and of the author's immediate departure the first three injections were then given on consecutive days. In view of the limited time the author spent in the Island, it is possible to give information regarding only a comparatively few cases. Details are given regarding 47 patients who received three injections and who had, at the time of Fischer's departure, remained free from trypanosomes for at least a month. Four patients in the third stage of the disease died. Five other patients relapsed between the 27th and 33rd days after the third injection.

In one patient (No. 107) the trypanosomes appeared to be resistant to the drug, as 8 days after the third injection the blood contained numerous parasites; these then disappeared for 6 days and again reappeared; two further injections caused them to disappear again, but only for 13 days. The treatment of young children proved very unsatisfactory, possibly because of the difficulty of finding the correct dose of the drug.

W. Y.

LLOYD (L.). **Report on the Treatment of Sleeping Sickness at the Tsetse Investigation Camp, Sherifuri.**—2 typed pp. 1925. Mar. 7. Sherifuri, via Kano.

Of 150 cases of sleeping sickness diagnosed at Sherifuri, N. Nigeria, 131 were treated with "Bayer 205." The routine treatment was a course of five injections each of 1 gm., the first three doses being given on alternate days and the last two at intervals of a week. Owing to the fact that the first two or three days usually produced a feeling of well-being, a number of the cases left before the course was completed. Efforts were made to get the natives to report the deaths of treated cases, and so far 15 deaths have occurred amongst the 131 treated. Of these, 11 had not completed the course, one had received 5, one 6, and one 7 doses of the drug. As the length of the treatment in the last three cases indicates, these were advanced cases. Lloyd points out that it must not be supposed that all these patients died of sleeping sickness, as there had been in that district during the previous year a heavy mortality from other diseases. Three cases reported a second time a year after the initial treatment. Lloyd believes that these were reinfections.

The best evidence of the efficacy of the drug is afforded by the history of the five cases which occurred among the Tsetse Investigation staff. Of these five, one is in perfect health 22 months after treatment and the others after 12 months; they have all been under constant medical observation.

Only one of the 131 appears to have been really resistant to the drug and to have shown no improvement; he was admitted in a very advanced stage, and after having received three doses of the drug died on the 7th day with parasites still in the blood.

Lloyd writes that the epidemic in Sherifuri appears to have died down. In 1923, 99 cases were reported; in 1924, 47 cases, and during the first two months of the present year only three cases. Although certain factors, such as thinning of the local population through causes other than disease, may have played their part, Lloyd considers that it is highly probable that the use of "Bayer 205" has helped very considerably to stem the epidemic.

This seems to be the series of cases upon which HANINGTON reported (this *Bulletin*, Vol. 22, p. 533).]

W. Y.

i. RAWSON (P. H.). **Report on Cases of Trypanosomiasis treated with "Bayer 205" at Arua, West Nile, during December, 1923, and January, 1924.** 13 pp. foolscap. MS. dated July 8, 1924. Received from Colonial Office, July 8, 1925.]

ii. SCHOFIELD (A. T.). **Report on Treatment of Sleeping Sickness at C.M.S. Hospital, Toro, Uganda.** [6 pp. foolscap. MS. undated. Received from Colonial Office, July 8, 1925.]

i. The first report is that of Dr. P. H. Rawson, who, in June, 1924, travelled to East and West Madi to examine cases of sleeping sickness which had been treated with "Bayer 205" during December, 1923, and January, 1924. Details are given concerning 9 cases, all of which have apparently done well after from 5 to 7 injections of the drug.

ii. The second report is from Dr. Schofield, who deals with the treatment of certain cases of sleeping sickness at the C.M.S. Hospital, Toro.

Six cases were selected for treatment with "Bayer 205." Two of these were of a severe cerebral type, 2 were of the early cerebral type, and 2 were fairly early cases. All came from Katwe or the Semliki River area. Only one of the cases had received previous treatment. Trypanosomes were found in the blood in 5 of the cases and in the gland juice of the other. "Bayer 205" was administered as recommended by KLEINE. Routine examinations of the urine were made, but no albuminuria was found, nor were there any ocular symptoms. Blood examinations made after the first injections were negative in every case. The treatment took place in July and August, 1924, and in October and November of the same year all but the two severest cases were discharged with negative blood and completely free from every sign or symptom of the disease. The 2 severe cerebral cases were kept longer under observation and, as one of them had, in September, a slight return of drowsiness, they were given 3 further doses of "Bayer 205" at weekly intervals. On October 16, when the author went on safari, both patients were apparently quite well, and still gaining in weight, but three days later, without any premonitory symptoms, both became comatose and died within 24 hours.

W. Y.

FREUND (R.). Zum biologischen Nachweis von Bayer 205 im Organismus. [**The Biological Demonstration of "Bayer 205" in the Organism.**]—*Deut. Med. Woch.* 1925. May 22. Vol. 51. No. 21. pp. 861–862. [13 refs.]

Reference is made to the fact that "Bayer 205" has been proved to persist in the organism for prolonged periods and that its protective action is believed to be bound up with this phenomenon. DALE has, however, pointed out that the experiments believed to support this view did not exclude the possibility that the protective substance was in fact some product of reaction between the drug and the body cells. There appear to be two possibilities: first, a new trypanocidal body is formed by the reaction of the drug and the body cells; or, secondly, in response to the stimulation of the drug, the cells form a new substance which is entirely of cell origin and contains neither "Bayer 205," nor a derivative of it.

A number of experiments devised with the object of throwing light on these questions are described. It was found that mice which had received a preliminary dose of ·5 cc. of 1 in 2,000 sol. of "Bayer 205" were protected against a normal strain of nagana, but not against a "Bayer 205" resistant strain. Similar results were obtained with the use of "Bayer 205" rabbit serum in the treatment of mice infected respectively with a normal strain of nagana and a "Bayer 205" resistant strain.

These experiments showed that the trypanocidal action which the blood of animals injected with "Bayer 205" possesses for a prolonged period is of no value against a "Bayer 205" resistant strain; they are decidedly against the view that the prolonged protection afforded by an injection of "Bayer 205" is due to a new substance of cell origin, and favour the view that the drug itself remains for an exceptionally long period in the animal organism.

W. Y.

FREUND (R.). Ueber die antimutative Wirkung des "Bayer 205." [**The Antimutative Action of "Bayer 205."**]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1925. June 8. Vol. 43. No. 3. pp. 253–268. With 2 text figs. [6 refs.]

The following summary is given :—

1. Mice infected with *T. brucei* which have received a non-trypanocidal dose of "Bayer 205" remain relapse free when subsequently treated with tartar emetic (direct antimutative action).
2. This action of "Bayer 205" is specific, dependent on the dose, but is no simple addition action.
3. This is supported by the fact that even in Germanin-free media (brought about by the transmission of the trypanosomes to normal mice) an (indirect) antimutative activity is observed.
4. Through the influence of non-trypanocidal doses of Germanin the trypanosomes undergo a paralysis of their relapse forming capacity ; in one instance this change survived through two passages.

W. Y.

KLIGLER (I. J.) & WEITZMAN (I.). **The Mode of Action of "Bayer 205" on Trypanosomes.**—*Ann. Trop. Med. & Parasit.* 1925. July 16. Vol. 19. No. 2. pp. 235–241. [11 refs.]

The experiments described in this paper were devised with a view to investigating the effect of "Bayer 205" on trypanosomes *in vitro*, and to ascertaining whether there is any relationship between its effect *in vitro* and *in vivo*. The author used a strain of *T. evansi* ; the parasites were exposed to the action of the drug *in vitro* and the effect on the organisms tested by their subsequent inoculation into animals.

The following are the conclusions :—

"The various experiments described above bring out two facts. First that contrary to our previous belief that Bayer exerts little trypanocidal action *in vitro*, it appears that the drug has a marked effect on the cell, so that a dilution of 1 : 1,600 is sufficient to destroy the virulence of the organisms. The other fact is that, in rabbits at least, the therapeutic, abortive and prophylactic doses are similar.

"It is difficult to make comparisons between *in vitro* and *in vivo* effect, because it is not possible to determine the amount of drug which remains in circulation. The work of Mayer and Zeiss indicates that the drug is bound in the blood stream by the serum, and is thus retained for many weeks. If the weight of the blood is accepted as approximately 1 15 the total body weight, it is possible to make a rough estimate of the effective dilution of the drug in the circulation. Our experiments show that doses of 0·005 gm. per kilo, or a dilution of 1 : 3,000, fails either to protect or cure an animal, while 0·01 gm. per kilo, or a dilution of 1 : 1,500, is effective in a proportion of cases. Even if we assume that only 50 per cent. of the drug is bound in the serum, the effective doses *in vivo* correspond fairly well with those *in vitro*. A still further correspondence is the fact that when small doses of the drug are given the trypanosomes disappear from the circulation only 16 to 18 hours after treatment.

"The rational conclusion then is that the therapeutic property of Bayer '205' is due to a direct injury to the trypanosomes which renders them avirulent for the host, and thus readily destroyed and eliminated. The difference observed in different hosts are probably due to the rate of elimination of the drug, or, in other words, to the residual concentration of the drug in the circulation."

W. Y.

KIANG (Tsin Sung). Ueber die Bildung spezifischer Antikörper durch die Behandlung mit "Bayer 205" ("Germanin"). [**The Formation of Specific Antibodies in Treatment with "Bayer 205."** —*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Oct. 15. Vol. 29. No. 10. pp. 572–588. [11 refs.]

In chronic trypanosome infections of rabbits the serum contains a substance which gives a Pfeiffer's reaction, *i.e.*, on injection with trypanosomes of the same strain as that with which the rabbit is infected into the peritoneal cavity of a mouse the parasites are disintegrated. The reaction is specific. *T. equiperdum* and *T. equinum* exhibit a reciprocal group reaction, but *T. brucei* is strongly specific.

On treatment with "Bayer 205" antibody is formed in large amount, is active after considerable dilution, and is highly specific. This augmentation of activity is not observed at once, but only after an interval of 3 to 10 days, and lasts for 3 weeks to 3 months. Repeated treatment of rabbits with small doses of the drug has the same effect.

The trypanocidal appearances manifest themselves in various degrees.

1. The light form.—First the motility of the parasite is affected, the parasite stains badly, pigment appears at both ends of the nucleus, vacuolation is seen, the flagellum becomes separated from the body and, finally, the whole shape of the parasite changes, and it appears to swell. These appearances can after some time undergo a retrograde process, and then numerous division forms appear.

2. The stronger form.—Motility is changed, the parasites stain badly, and their outline is barely visible. Vacuolation is marked and the change in form is very great; the parasites shrink and become ring-formed.

3. The strongest form.—Motility soon ceases; in stained preparations only a few highly vacuolated parasites are seen. In half an hour only free nuclei, blepharoplasts and flagella are visible.

W. Y.

LAIGRET (J.) & BLANCHARD (M.). Premiers essais du produit 309 dans quelques trypanosomiases expérimentales et en trypanosomiase humaine. [**Trial of "309" in Experimental and in Human Trypanosomiasis.** - *Bull. Soc. Path. Exot.* 1925. May 13. Vol. 18. No. 5. pp. 410–420. [2 refs.]

The authors have examined the therapeutic action of the product "309" prepared by FOURNEAU, TRÉFOUEL and VALLÉE, which is believed to be identical with "Bayer 205." The drug was first tried on guineapigs infected with *T. pecaudi* and *T. gambiense*, and it was found to exert a trypanocidal action exactly comparable with that of "Bayer 205." A dose of 0·05 gm. per kilo sufficed to cure guineapigs if given within a month of infection, and 0·08 gm. given later produced the same result.

In the treatment of human trypanosomiasis it is stated that "309," like "Bayer 205," gave results definitely inferior to those of arsenicals. Peripheral sterilization was easily obtained, but was of short duration, and provoked albuminuria in most of the cases.

The drug exerted a prophylactic action similar to that of "Bayer 205," either when given before infection or when used as a curative agent; in each case the animals were protected for a period against further infection. It is surmised that "309" will prove of considerable

service in protecting animals destined for the Brazzaville slaughter house and workmen on the railway. It is as yet, however, too early to write with certainty regarding the value of the drug as a prophylactic in man, as one must know more regarding its action on the kidneys.

W. Y.

BLANCHARD & LAIGRET. Premiers résultats du traitement de la maladie du sommeil par le tryparsamide à l'Institut Pasteur de Brazzaville. **First Results of the Treatment of Sleeping Sickness by Tryparsamide at the Pasteur Institute Brazzaville.** —*Ann. de Méd. et de Pharm. Colon.* 1925. Jan.–Feb.–Mar.–Apr. Vol. 23. No. 1. pp. 131–134.

Thirty patients have been put on treatment, but many of them have not yet completed their course: the first results, which are recorded in this note, relate to 16 cases, the observation of which has not, however, exceeded one month.

With regard to the patients in the first stage of the disease, the authors write that the results given by atoxyl are so excellent that the only interest a new drug has is in its effect on the second stage. Consequently, only two patients in this category were treated with tryparsamide, and the drug was found to have a powerfully sterilizing action on the peripheral circulation.

Fourteen patients in the second stage of the disease were treated. Four died, but these were practically moribund when treated; in three the condition was aggravated, and in three very much ameliorated with disappearance of the somnolence; in four cases the condition was good before treatment.

With regard to the spinal fluid it was found that the trypanosomes disappeared, the lymphocytosis diminished, but the effect on the albumose content was inconstant.

In a table are given details of the dose of the drug administered and the result of examination of the spinal fluid before and after treatment in the case of each of the 14 patients in the second stage.

W. Y.

CHESTERMAN (Clement C.). **The Efficacy of Tryparsamide in the Cure of African Sleeping Sickness.**—*Lancet.* 1925. Nov. 7. pp. 965–967. With 1 text fig. [10 refs.]

Before discussing the results obtained in the treatment of sleeping sickness by tryparsamide, the author briefly reviews the value and limitations of the main drugs and treatments in vogue up to the present. He writes as follows:—

"To recapitulate, therefore, there are a variety of drugs which are capable of effecting and maintaining sterilisation of the peripheral circulation for varying periods. Sterilisation is effected most quickly by tartar emetic, less so by atoxyl, and least quickly by Bayer '205,' but the reverse order holds good for the maintenance of sterilisation when once effected. This brings out the real value of 'Bayer' to the sanitarian concerned with the removal of infectivity. None of these drugs can, however, be relied upon to cure a case which has shown definite nervous involvement."

As regards tryparsamide, Chesterman records that all of 5 cases with unaltered spinal fluid were well and apparently cured 3½ months

to a year after treatment. Turning to those cases which at the time of treatment exhibited altered spinal fluid, Chesterman notes that the latest information regarding his series of 40 such cases treated by tryparsamide (this *Bulletin*, Vol. 20, p. 694 ; Vol. 22, p. 139) shows that one further case (No. 146, Mbalika) has died, and thus the figures for those still alive after $2\frac{1}{2}$ to $3\frac{1}{2}$ years falls to 37·8 per cent. Stress is laid on the fact that these cases were the worst that could be found, averaging 630 cells per cmm. in the cerebrospinal fluid.

Unfortunately, there are a number of cases which do not react so favourably to tryparsamide, so that in claiming that the drug can cure, we cannot claim that it is a cure of all cases. The author believes that this is due to different degrees of immunity exhibited by various individuals.

Writing on suggestions for treatment Chesterman says the best control of treatment is the examination of the cerebrospinal fluid for cells or albumin. The latter is simply effected by precipitation of the albumin in 1 or 2 cc. by trichloracetic acid (33 per cent.) and comparison of the opacity with standardized bacterial emulsion.

The drug should never be given in doses exceeding 4 gm. The maximum tolerated dose must be arrived at gradually in advanced cases, but must be maintained whenever possible for at least 10 injections, which may be either weekly or fortnightly. A short course should be given whenever possible 6 months after the first, the cessation of which is to be guided by progress and the condition of the cerebrospinal fluid. It must be remembered, however, that the cerebrospinal fluid will progress towards the normal limits subsequent to the cessation of treatment if that has been thorough ; an excess of cells, even up to 50 per cmm., may have entirely disappeared after three months.

W. Y.

FAIRBROTHER (Thomas H.), MASON (Frederick A.), PERKIN (William H.) & RENSHAW (Arnold). **The Preparation of Certain Substituted Ureas and their Use in the Treatment of Trypanosomiasis.** *Jl. Path. & Bact.* 1925. July. Vol. 28. No. 3. pp. 515–521.

The following are the conclusions :—

"1. There is definite evidence of trypanocidal properties in the substituted ureas, which are entirely dependent on the configuration of the molecule and on the groups which go to form the molecule.

"2. The only one of the three ureas studied which showed marked trypanocidal power was the one (No. 3) with the formula suggested by Fourneau, viz., the urea from meta-aminobenzoyl para-methyl meta-aminobenzoyl amino-naphthalene tri-sulphonate 4 : 6 : 8.

"3. We have shown that this power is not due to the ending of the urea chain in K. acid (the "acide B" of Fourneau), because urea 2, which contains two molecules of K, acid was inactive. This leads to the conclusion that the activity is due to the variation and arrangement of the benzoyl and toluyl residue in the urea chains.

"4. The trypanocidal action of urea 3 *in vitro* requires further investigation, since in one case a delayed infection occurred.

"5. The tolerated dose is 10 mgrm. per 20 grm. mouse, whereas the curative dose has been as low as 0·05 mgrm. a $\frac{C}{T}$ ratio of $\frac{200}{1}$ being obtained."

W. Y.

LEUPOLD (Frida). Die Bedeutung der Blepharoplasten als Angriffspunkt chemotherapeutischer Substanzen. **The Significance of the Blepharoplast as the Point of Attack of Chemotherapeutic Substances.**]—*Ztschr. f. Hyg. u. Infektionskr.* 1925. June 6. Vol. 104. No. 4. pp. 641–647.

Arsenic-resistant trypanosomes cannot be made blepharoplastless by trypaflavin as can normal strains, as can easily be seen in stained preparations. It is possible that the chromatin substance of the blepharoplast is so changed by arsenicals that its affinity for acridin dyes is lost and it becomes no longer susceptible to the action of trypaflavin.

Trypanblue-fast trypanosome strains behave in a similar manner, so that the blepharoplast must also serve as the point of attack of dyes of the benzidine series. Strains resistant to tartar emetic and to "Bayer 205" are just as susceptible to the action of trypaflavin as are normal strains.

A complete loss of the blepharoplast through the action of trypaflavin need not, however, be assumed, since it is still possible to demonstrate in trypanosome strains, the blepharoplast of which is no longer stainable, a chemically active function of the blepharoplast which makes the occurrence of certain residual affinities probable. A trypanosome strain resistant to the fuchsin dye tryparosan and blepharoplastless is destroyed by trypaflavin. Moreover, it is possible to make resistant to arsacetin this fuchsin blepharoplastless strain, which is susceptible to trypaflavin, although arsacetin has been previously shown to have an affinity for the blepharoplast. This strain doubly resistant to tryparosan and arsacetin was now found to be resistant to trypaflavin. For the explanation of this two hypotheses are possible. Firstly, that the chemical affinity of the chromatin substance of the blepharoplast remains, and its staining capacity alone is lost; secondly, that the chromatin substance of the nucleus is also concerned in the fixation of arsenicals.

The observation that a "Bayer 205" resistant strain behaves towards substances which have an affinity for the blepharoplast in the same manner as normal strains is at first sight apparently not in agreement with the previous observation that "Bayer 205" and arsenicals have the same point of attack. This contradiction is, however, at once explained if one assumes that the dyes having a blepharoplast affinity have also one for the nucleus.

W. Y.

KROÓ (A.). Beitrag zur Immunbiologie der Trypanosomen. Ueber Stammeinheit und Arteinheit des *Trypanosoma brucei*. [**The Immunity Relations of the Trypanosomes. Unity in Strain and Species of** *T. brucei*.]—*Ztschr. f. Hyg. u. Infektionskr.* 1925. Aug. 19. Vol. 105. No. 1. pp. 247–253.

The author discusses briefly the various serological tests which have from time to time been advocated—particularly by the French school—as useful in the separation of trypanosome species. In his own work he used 3 strains of *T. brucei*, viz., strain "Prowazek," from the Robert Koch Institute, Berlin; strain "Ferox" from the Georg-Speyer-Haus, Frankfurt a.M.; and a strain from the Pasteur Institute, Paris. Twenty-four mice were inoculated with the Prowazek strain and on the third day, when their blood contained about 10 to 20 parasites

per microscope field, they were treated with ·2 cc. per 20 gm. body-weight of 1 in 1,000 solution of potassium antimony tartrate. The next day the blood was negative in every case, and previous experiments had shown that it would remain so for at least 7 days. On the day the blood became negative (the fourth) 8 of the mice were inoculated with one of each of the above three strains. It was found that, whereas those inoculated with strain Ferox and the Pasteur Institute strain all became infected and had died by the eighth day, those re-inoculated with strain Prowazek had not shown parasites in the blood within this period. Similarly, experiments performed on mice infected with each of the other strains gave comparable results.

From this work the author concludes that such reactions are strain-specific and consequently unsuitable for differentiation of species.

W. Y.

NEUMARK (Eugen) & POGORSCHELSKY (Herbert). Das Vorkommen trypanocider Substanzen bei Säuglingen. [**The Occurrence of Trypanocidal Substances in Sucklings.**]—*Klin. Woch.* 1925. Sept. 3. Vol. 4. No. 36. pp. 1724–1725.

The conclusions are the following :—

1. Healthy sucklings have no detectable amount of trypanocidal substance in the serum during the first weeks of life.
2. As age increases the trypanocidal substances appear and are well developed at the end of three months.
3. Any infection is sufficient to cause a decrease of trypanocidal substance.
4. "Dysergitic" children (of ABEL) exhibit a lack of trypanocidal substance.
5. In several cases of pronounced Barlow's disease and premonitory haemorrhages, the lack of trypanocidal substances was found to be due to accompanying, or previous, infections.

W. Y.

LEICHTENTRITT (B.). Die Bedeutung der Trypanociden Serumkörper in der Kinderheilkunde. [**The Significance of the Trypanocidal Serum Substance in Child Therapeutics.**]—*Klin. Woch.* 1925. Oct. 1. Vol. 4. No. 40. pp. 1899–1905. With 5 text figs.

The serum of healthy human beings injected into a mouse stimulates the reticulo-endothelium to produce protective bodies and the mouse survives trypanosome infection. If the same serum is injected into a mouse the reticulo-endothelium of which is blocked through india-ink, serum, or vaccines, so that through exhaustion or blockage the protective substance is no longer formed, the animal speedily dies of the infection. In a similar manner the mouse dies if an inactive serum is injected. This is the case in icterus, as the reticulo-endothelium does not become attached to the defence-producing substance. An inactive serum can result from various causes in the human organism. In icterus neonatorum the trypanocidal substances are only feebly present. In severe defects due to bad dietary and, above all, kera-tomalacia resulting from lack of vitamins there is a disappearance of the substance. This defect is due to specific malnutrition, to formation of toxins, or to the formation of certain intermediate products of metabolism.

W. Y.

MUNTER (Friedrich). Die klinische Bewertung der trypanociden Funktion der Leber. [**The Clinical Assessment of the Trypanocidal Function of the Liver.**] —*Klin. Woch.* 1925. Oct. 8. Vol. 4. No. 41. p. 1967.

The following summary is given :—

1. Normal serum in doses of ·2 cc. per 20 gm. of body weight always cures mice infected with trypanosomes, and frequently in doses of ·15 cc., and even ·1 cc. has a distinctly beneficial effect.
2. In a case of liver coma the trypanocidal power of the serum was so reduced that 1 cc. was inactive.
3. In the cases of diffuse parenchymatous degeneration of the liver investigated by the author, the diminution of the trypanocidal power of the serum was exactly parallel to the severity of the disease as judged by clinical and other functional tests.
4. In cases of parenchymatous degeneration which does not affect in the same degree all portions of the liver, a definite decrease in the trypanocidal activity of the serum proceeds *pari passu* with the partial degeneration.
5. The presence or absence of icterus has no influence on the trypanocidal power of the liver.
6. The method has in the author's experience a quantitative value, and permits a judgment of the degree of parenchymatous degeneration of the liver.

W. Y.

LAVIER (G.). Infections héréditaires par les parasites animaux. [**Inherited Parasitic Infections.**] *Ann. Parasit. Humaine et Comparée.* 1925. July. Vol. 3. No. 3. pp. 306–324. [87 refs.]

This is already a summarized statement of the record, and cannot be further condensed. A bibliography is appended.

The author includes an abstract of his own observations of litters of guineapigs from mothers experimentally infected with different species of trypanosomes (*T. rhodesiense, evansi, pecaudi, marocanum, equinum*). In not one of 7 experiments was any inherited infection observed, but the mortality in the litters was great, and the foetal liver usually was a little paler and more fatty than in the normal guineapig foetus. In one instance the surviving individual of the litter of a mother infected with *T. evansi* was inoculated with an attenuated strain of *T. evansi*, and its blood (tested on mice) did not become virulent : this might suggest an inherited immunity.

A. Alcock.

CAMPOS (Ernesto de Souza). Sur la paralysie des animaux (chien, souris), infectés expérimentalement avec les cultures de *Trypanosoma cruzi*. [**Paralysis of Dogs and Mice infected Experimentally with Cultures of** *T. cruzi*.]—*C.R. Soc. Biol.* 1925. June 12. Vol. 93. No. 20. pp. 40–42. [2 refs.]

In a previous note [this *Bulletin*, Vol. 22, p. 134] the author has given a clinical account of the nervous signs exhibited by dogs infected with *T. cruzi*. On examination of the spinal cord, disseminated inflammatory foci were found in the grey and white matter and arranged in a definite fashion ; in some of these foci numerous aflagellar forms of the trypanosomes were present. Similar lesions were noted in dogs infected with a strain of parasites which had been passed

through a number of guineapigs, although these animals do not themselves develop paralysis. In view of this fact, the author has enquired whether the elective action of the parasites would be conserved when they had been cultivated on artificial media. The trypanosomes were cultivated on blood agar and transplanted every 8-15 days; after 23 subcultures the growths always showed both trypanosomal and crithidial forms. Dogs inoculated from the 18th to 23rd subcultures always developed nervous signs, showing that the neurotropic activities of the parasites had been preserved intact. Sections of the spinal cord showed numerous patches of infiltration and of neuroglia proliferation, sometimes with leishmania forms of the parasite.

W. Y.

VILLELA (E.) & TORRES (C. Magarinos). Lésions histopathologiques dans la paralysie expérimentale à *Schizotrypanum cruzi* chez le chien. Nature des cellules contenant le parasite dans le système nerveux central. [**Histological Lesions in *S. cruzi* Paralysis in Dogs. Nature of the Parasite-containing Cells in the Central Nervous System.**]—*C.R. Soc. Biol.* 1925. June 19. Vol. 93. No. 21. pp. 133–135.

The material was obtained from a series of 40 dogs inoculated with a strain of *T. cruzi* isolated from *Tatus novemcinctus*, which produced paralysis in almost all the animals within a month.

The central nervous system of the paralysed animals exhibited small inflammatory foci in constant relationship with the intracephalic capillaries and pre-capillaries: they were distributed indifferently in the white and grey matter, and were rarer in the cerebellum than elsewhere. The foci were formed of macrophages, some of which had evidently emigrated from the vessels, but others—the more numerous—were derived probably from the regional neuroglia; the disintegration of the nervous tissue, the formation of numerous cells, and finally sclerosis, were the successive steps in the evolution of the foci; leishmania-forms of *T. cruzi* were frequently met with. The blood-vessels showed an infiltration of the adventitia. Other histological details are given.

W. Y.

i. CARPENTER (G. D. Hale). **The Biology of Sleeping Sickness.**—*Kenya Med. Jl.* 1925. May, June & July. Vol. 2. Nos. 2, 3 & 4. pp. 35–41; 65–74; 96–103.

ii. KRAUSE (D. M.). [**Tryposafrol in Trypanosomiasis.**]—Sonderdruck aus dem *Deutschen Kolonialkongress.* 1924. 1 p.

iii. GIEMSA (G.). Ueber die Wirkung von Chinin und Chininderivaten auf Naganatrypanosomen. **The Action of Quinine and Quinine Derivatives on Nagana Trypanosomes.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Oct. 15. Vol. 29. No. 10. pp. 479–485. With 2 text figs. [31 refs.]

i. These three articles contain an interesting review of the present state of knowledge on sleeping sickness mainly as it concerns Uganda.

ii. A plea for testing the value of tryposafrol in human trypanosomiasis in the same careful and thorough manner in which "Bayer 205" is being examined.

iii. This paper is of a chemical nature and should be consulted in the original by those interested.

W. Y.

BLACKWATER FEVER.

STEPHENS (J. W. W.). **Blackwater Fever.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 121–128. [United Fruit Company, Boston, Mass.]

The author states that he has thought it best to avoid discussing the pros and cons of the very numerous views that have been expressed from the time of TOMASELLI, and to limit himself to an attempt to place the facts of the matter before his readers.

After a brief discussion of the definition of the disease, the author mentions the following interesting points :—

1. Blackwater may occur in a European arriving for the first time in the Tropics as early as six weeks after his arrival.

2. It may occur as late as a year after he has left the Tropics.

3. Second attacks (or more than two) occurred, according to DEEKS and JAMES, in about 5 per cent. of the cases in Panama. The figure for Nigeria is about 20 per cent.

4. Occurrence of two or more attacks, in one patient, in the Tropics is not very uncommon. Thirteen is the largest number he has found recorded, and these occurred in France, during the course of a year, in a patient who had returned from Senegal, West Africa.

5. Recurrences while the patient is in the hospital are a peculiar and puzzling phenomenon. About 10 per cent., perhaps, expresses the frequency. The interval between the first attack and the recurrence may be as long as twelve days ; or often, where the occurrences are numerous, only a few hours. Eleven is the greatest number of recurrences found recorded, the total duration of the attacks being 643½ hours.

6. Post-haemoglobinuric fever. An obscure condition, apparently not uncommon, of a fever, sometimes severe, lasting many days after the haemoglobinuria ceases. He has no figure for the frequency.

Referring to the malaria factor, Stephens believes that the following facts are approximately correct :—

Malarial parasites are found in 75 per cent. of the cases on the day before the onset, in 50 per cent. of cases on the day of the onset, and in 20 per cent. of cases on the day after the onset. The evidence as regards spleen puncture is conflicting, BARRATT and YORKE failing to find parasites in six cases, whilst CHRISTOPHERS and BENTLEY found them in four of five cases. In 39 post-mortems in which definite statements are made, pigment or parasites were present in 32. With regard to the species of parasite, the author lays down that malignant tertian parasites occur in blackwater in a proportion comparable to that found in malaria cases in the blackwater area. There are apparently only seven records of the quartan parasite in blackwater fever in the whole of the literature.

It is stated that it is certain that quinine can produce haemoglobinuria, and two typical cases (one of KOCH'S and one of LOVELACE'S) are mentioned.

Reference is next made to the condition of the blood and urine in blackwater fever and a short account of the pathology is given. Discussing the question, " What is the essential cause of the blood

destruction in blackwater ? " Stephens refers to the fact that all attempts to demonstrate haemolysin in malaria or blackwater have failed, but he argues that it does not follow that the haemolysin does not exist, for the simple reason that when once haemolysin is injected into an animal, we can no longer detect that haemolysin, except by its lethal result. He considers that until the presence of a haemolysin can be negatived by good evidence, we may adopt this as a provisional hypothesis.

W. Yorke.

DEEKS (W. E.). **The Aetiology of Haemoglobinuric Fever.**—*Jl. Trop. Med. & Hyg.* 1925. Mar. 2. Vol. 28. No. 5. pp. 101–102.

Few problems in tropical medicine have caused more controversy than the aetiology of blackwater fever. Three theories have been advanced in explanation :—

(1) That it is a symptom-complex of a malarial infection.
(2) That it is caused by a specific organism which occurs in localities where malaria is present.
(3) That the administration of quinine alone is responsible for precipitating an attack.

Most authorities now believe that blackwater fever is associated in some way with a malaria infection and that *P. falciparum* is chiefly, if not altogether, incriminated. If this hypothesis be correct, the question naturally arises how haemolysis occurs in a malaria infection. After referring to BORDET's discovery that defibrinated rabbit's blood, when injected into a guineapig, results in the production of a haemolysin, Deeks goes on to state that we have reason to believe that the haemoglobin of the red cells consumed by the malaria parasite during feeding will develop haemolytic agents in its body substance similar to those which are developed in the guineapig's blood after injection of rabbit's red cells. In other words, it can be logically inferred that each malaria parasite develops a haemolytic property. Not only are red cells destroyed in malaria, but the colour index of the remaining individual red cells is lowered to a considerable degree, and it is reasonable to believe that this is due to a haemolytic agent. The author sees an analogy in hookworm infection where it is obvious that the small amount of blood consumed daily by several hundred worms will not account for the severe anaemia observed in these cases.

Deeks calculates that in a severe malaria infection where 20 per cent. of the red cells are invaded there is approximately 23·3 cubic inches of malarial protoplasmic material, and he considers that this would undoubtedly be capable of producing an enormous amount of haemolysin in the human blood and in response to its action a large amount of antihaemolytic substance. Any of the depressing agencies which are considered as aetiological factors and which might interfere with the development of antihaemolytic bodies would permit extensive haemolysis to ensue in such quantities that the liver and spleen would be unable to deal with the liberated haemoglobin, and haemoglobinaemia followed by haemoglobinuria would result. In paroxysmal haemoglobinurias following quinine—which destroys large numbers of trophozoites—so much haemolysin is suddenly liberated that the antihaemolytic substance is unable to neutralize it and haemoglobinuria results. If this hypothesis be correct, it affords a reasonable

explanation why, in the treatment of post-haemoglobinuric fever, small doses of quinine should be given at first, so as not to destroy too many parasites at once and thus precipitate another attack.

W. Y.

HEWETSON (W. M.). **The Aetiology of Blackwater Fever.**—*Jl. Trop. Med. & Hyg.* 1924. Dec. 15. Vol. 27. No. 24. pp. 333–336; & 1925. Feb. 16 & Mar. 2. Vol. 28. Nos. 4 & 5. pp. 88–92; 105–110. [28 refs.]

In this series of papers the author puts forward the hypothesis that there is some relation between light and the development of blackwater. Such connection is not of a simple nature, and is associated with the occurrence of a morbid condition which, by its peculiarities of association, must be malaria. It is suggested that the haemolysis which constitutes blackwater fever is due to the presence of an optical sensitizer, probably one of the porphyrins which is developed under certain conditions, causing lowered hepatic activity in the course of the active stages of malarial blood destruction. [These papers are of a somewhat special nature, and do not lend themselves to summarizing; they should be consulted in the original by those interested.]

W. Y.

i. STERN (E.). Das Schwarzwasserfieber in Palästina. Klinische Beobachtungen in den letzten 40 Jahren. [**Blackwater Fever in Palestine. Clinical Observations during the Last Forty Years.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. June 1. Vol. 29. No. 6. pp. 264–283. [4 refs.]

ii. ——. Nachtrag zu meiner Arbeit "Ueber das Schwarzwasserfieber in Palästina." [**Postscript.**]—*Ibid.* Aug 1. No. 8. pp. 400–401.

i. It is only during the last 40 years, since the re-colonization of Palestine by the Jews, that it has been possible to make any accurate study of the occurrence of blackwater fever. The disease is found chiefly in three regions, viz.: the low-lying coast region from Acre in the north to Gaza in the south, the Israel plain, and the valley of the Jordan. In the higher regions cases were but rarely encountered. A lengthy historical account of the disease in Palestine is given.

The author was unable to satisfy himself that the disease occurred more commonly at any particular period of the year; it was met with in both sexes, but more commonly in males than in females, and only occasionally among young children or old persons. At least 85 per cent. of the cases occurred amongst immigrants; severe paludism was often seen among the native Arabs, but blackwater fever practically never. The author believes that in Palestine a certain degree of immunity to malaria, and especially insusceptibility to blackwater fever, has arisen in the course of generations, and he cites certain observations which he believes support this hypothesis.

In Palestine, as elsewhere, the majority of cases of blackwater fever occurred among persons with long-standing malaria, but the author saw a number of patients in whom there had been no definite malaria previously, but who had suddenly felt unwell, had taken a little quinine and then gone to the doctor who found the blood negative; the next day a slight attack of blackwater fever developed. Repeated attacks of the disease often occurred in the same individual; sometimes there

were two or three attacks within a year, but at other times there was an interval of 3 to 5 years between the first and second attacks, and then the second attack was often very severe and even fatal. The paper closes with an account of the symptomatology, aetiology, diagnosis, prognosis, treatment, and prophylaxis of the complaint.

ii. In this note the author expresses the belief that malaria is the chief factor in the aetiology of blackwater fever. He considers that death in fulminating cases of blackwater is due to the three following causes: (1) Blood corpuscles are destroyed in enormous numbers by the malignant tertian parasite; the ghosts of these red cells contain slightly toxic substances which exert a haemolytic action, and they likewise block up the renal tubules, producing anuria; (2) Owing to the great destruction of red corpuscles the tissues are not properly oxygenated and are hence incapable of proper functioning and the production of antibodies; (3) The tissues become overcharged with CO_2, a condition which is injurious to the heart muscle and nervous system.

W. Y.

POPOW (P. P.) & ZEISS (H.). Das Schwarzwasserfieber in Russland. [**Blackwater Fever in Russia.**]—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Vol. 29. No. 1. pp. 284–292. [14 refs.]

The following summary is given:—

1. Blackwater fever has hitherto (1879–1923) been seen in St. Petersburg, Moscow, Novorossisk, Batum, Baku, Transcaucasia, Armenia, and the Transcaspian district.

2. Natives and foreigners are equally attacked.

3. In all 90 cases are described in Russian literature, and of these 85 can be considered to be true cases of this disease. Two cases were indefinite, and of the remaining 3 there is no documentary evidence. Of the 85 certain cases 83 were malarial and followed quinine treatment, 1 was malaria and occurred after neosalvarsan, and 1 had apparently neither malaria nor quinine: the series comprised 70 men and 15 women.

4. The disease occurred one month to two years after the first attack of malaria.

5. Almost all cases of blackwater fever in Russia occur in winter, or in the colder periods of the autumn or spring: the climatic cold doubtless plays an important part in precipitating attacks in Russia.

W. Y.

DUPUY. Fièvre bilieuse hémoglobinurique. [**Blackwater Fever.**]—*Bull. Méd. du Katanga.* 1925. June. Vol. 2. No. 3. p. 121.

This note is a record of 4 cases of blackwater fever—one complicated by haemorrhagic pleurisy, one complicated by a relapse, one mild case, and one very severe case with intense anaemia and albuminuria—successfully treated by subcutaneous injections of anti-venom.

W. Y.

RUDOLF (G. de M.). **Haemoglobinuria following Malarial Treatment of Quaternary Syphilis.**—*Brit. Med. Jl.* 1925. May 23. pp. 964–965. [3 refs.]

Reference is made to the fact that SCHILLING and JOSSMAN have reported an instance in which haemoglobinuria occurred in a patient experimentally infected with *P. vivax* (see this *Bulletin*, Vol. 22, p. 417);

these authors were not definitely able to exclude paroxysmal haemoglobinuria, but believed that the case was one of blackwater fever. Rudolf gives details of a similar case. A man aged 56 was given a subcutaneous injection of defibrinated *P. vivax* blood on October 25, 1923. He developed fever 12 days later, and was allowed to have 9 rigors, the last of which occurred on November 22. A course of quinine treatment was commenced the following day, viz.: 20 grains daily for 3 days and then 10 grains daily for the following 14 days. In addition, three doses of neokharsivan were given, the last on December 30. The temperature remained normal until February 18, 1924, *i.e.*, 71 days after the last dose of quinine, when it rose to 103·6° F., and black urine was passed. The next day the urine was red and then gradually became normal.

The author discusses the question whether this attack was paroxysmal haemoglobinuria or blackwater fever, and reaches the conclusion that it was probably a case of the former complaint, notwithstanding the fact that examination for the presence of cold haemolysin was negative.

W. Y.

THOMSON (John Gordon). **The Morphology of *Plasmodium falciparum* found associated with Haemoglobinuric Fever in Southern Rhodesia; with Notes on the Blood Changes produced by this Parasite, and on the Prevention of Blackwater Fever.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 129–135. [4 refs.] [United Fruit Company, Boston, Mass.]

Haemoglobinuric fever may be associated with any of the three malarial parasites, but in Thomson's opinion the only true causal factor is *P. falciparum*. In Southern Rhodesia during 1923, of 100 positive blood films *P. falciparum* was found in 96, *P. vivax* in 3, and *P. malariae* in 1; very similar figures were obtained the previous year. In 23 cases of blackwater fever examined before the onset, *P. falciparum* was found in every instance. In all cases of blackwater fever examined before the onset it could not be claimed that the infection in the peripheral blood was heavy, but an examination of a single blood film in malignant tertian malaria gives no real indication of the amount of infection in the body. In all positive cases there was remarkable absence of acute symptoms, the patients felt out of sorts, were anaemic, had characteristic lemon-tinted sclerotics, and the majority complained of biliousness and attacks of indigestion with occasional fever. All these symptoms are, in fact, characteristic of long-standing pernicious malaria. In 23 of the author's cases parasites disappeared from the peripheral blood the day after the onset of haemoglobinuria.

Referring to the morphology of the parasite, the author points out that it has been usual to recognize only one species in benign tertian and quartan malaria respectively, but that difficulties have arisen with regard to malignant tertian malaria. These difficulties are due to the various clinical manifestations caused by it, and also to the enormous differences seen in the shape and size of the asexual forms in the peripheral blood. A brief summary of the literature on the subject is given. In view of the differences of opinion regarding the unicity of the various malignant tertian parasites which have been described, Thomson decided to examine carefully parasites found associated with blackwater fever in Southern Rhodesia. He was,

however, unable to determine any morphological differences, and concludes that there is only one species of malignant tertian parasite in Rhodesia, viz., *P. falciparum.*

W. Y.

BOURGES (Henry). Hémoglobinurie avec hémolysinémie, déglobulisation massive et ictère polycholique intense au cours d'un processus hémolytique latent chez un paludéen ancien. [**An Unusual Case of Haemoglobinuria in a Former Subject of Malaria.**]—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1925. Feb. 26. Year 41. 3rd Ser. Vol. 49. No. 7. pp. 267–271. [2 refs.]

The patient to whom this paper refers contracted malaria in Macedonia in 1915. From April, 1922, to April, 1924, he lived in Tchad without, however, exhibiting the least sign of malaria. On the way home, shortly after arriving in France, he had several attacks of fever. He was in hospital from June 20 to July 4, and was slightly icteric and anaemic, the spleen was enlarged and the urine normal; the blood was negative, as was also the Wassermann reaction. On September 25 he was again admitted to hospital for jaundice and anaemia. On October 1, during the night, he complained of pains in the epigastrium, which were followed by repeated bilious vomiting. On examination the patient was found to be intensely icteric, the liver was enlarged and tender, the spleen was considerably enlarged, the faeces were hypercholic, the urine was small in quantity and of a port wine colour, the temperature was normal, and the pulse 100. On October 2 the jaundice was still marked, the spleen was enlarged and the urine contained albumen, but no casts. The red cell count was 1,707,000. Examination of the blood failed to reveal the presence of auto- or iso-agglutinins, or of autolysins, but an isolysin reaction was obtained. A further history of the case, which terminated in recovery, is given in detail.

The author then goes on to consider the cause of this condition. It was possible to exclude paroxysmal haemoglobinuria owing to the negative autolysin reaction. The history of malaria suggests that the case might be simply one of blackwater fever, but the author points out that the total absence of fever constitutes a difficulty, and he finally comes to the conclusion that the clinical and haematological signs presented by the case suggest that it was one of haemolytic icterus, secondary to an anaemia of malarial origin.

W. Y.

KESSLER (A.). Ueber die Bedeutung der Lezithinhämolyse für die Schwarzwasserfiebertheorie. [**The Significance of Lecithin Haemolysis for the Blackwater Theory.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Apr. 1. Vol. 29. No. 4. pp. 153–162. [3 refs.]

Reference is made to the conclusion of KRITSCHEWSKY and MURATOFFA that the haemoglobinuria in malaria is in great part due to the combined action of quinine with lipoid substances of the organism (this *Bulletin*, Vol. 21, p. 386). The author has investigated this question and finds that lecithin in great dilution aids quinine haemolysis. On the contrary, however, his experiments afford no support for the view that serum rich in lipoids accentuates quinine haemolysis; even with a serum so rich in lipoids as was one obtained from a comatose case of diabetes no increase in quinine haemolysis was obtained.

W. Y.

TROUT (Charles Lewis). **The Treatment of Blackwater Fever.**—*Jl. Trop. Med. & Hyg.* 1925. June 15. Vol. 28. No. 12. pp. 225–228.

During the author's five and a half years' practice as a mission doctor in the Congo, four missionaries died from blackwater fever—three during the second attack and one during the first. The last case had been in the Congo five years and had taken 5 grains of quinine daily; the others took quinine once or twice a week.

This paper is based on the treatment of 34 patients, 12 of whom had a second attack. Seventy-five per cent. took quinine daily. The author lays stress on the value of anti-venom or horse serum in the treatment of blackwater and states that since its adoption no case has been lost, and that several cases in a moribund state made a remarkable recovery after injections of serum.

The following summary of the treatment recommended is given :—

"(1) General measures: good nursing, proper attention to kidneys, bowels, heart, etc.; use of salt solution; hypodermoclysis.

"(2) Administer anti-venom or horse serum: one ampoule, repeat in case of relapse. In asthmatics use crotalin $\frac{1}{100}$ gr., if there is sensitivity to horse serum.

"(3) Give by mouth plenty of fluids and inject subcutaneously 0·25 grm. caffeinae sodio-benzoatis.

"(4) Administer orally cantharides tincture: prepare as follows: 5 drops in 2 ounces of water, to which add 1 dram of sodium bicarbonate. Stir this mixture well and give two teaspoonfuls every half-hour until urine is normal.

"(5) During icterus give calomel in small divided doses.

"(6) During convalescence give iron tonics."

W. Y.

SCHAEFER (H.). Ueber Novasurol bei Schwarzwasser-Anurie. [**On Novasurol in Blackwater Anuria.**] —*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Vol. 29. No. 1. pp. 310–311.

Details are given of a case of blackwater in which revival took place, apparently after the onset of anuria, after two subcutaneous injections, each consisting of 1 cc. of novasurol; death followed after 16 days' illness.

W. Y.

FACIO (A. A.) & ROJAS (M. D.). **The Treatment of Haemoglobinuric Fever with Caffeine Sodio-Benzoate.**—*Jl. Trop. Med. & Hyg.* 1925. Feb. 16. Vol. 28. No. 4. pp. 86–88.

In this paper the authors advocate the administration of caffeine sodio-benzoate grains 3, intramuscularly, twice daily, in cases of blackwater fever. They have a record of 12 cases of haemoglobinuric fever—"5 of them were true blackwater fever, and the remaining 7 were probably cases of quinine haemoglobinuria"—all of whom recovered. An experiment is recorded showing that the drug *in vitro* exerts an anti-haemolytic power when added to a haemolytic system consisting of anti-human haemolytic amboceptor, complement, and human red cells.

W. Y.

HUCHARD (G. L.). A propos d'un nouveau cas d'hémoglobinurie paludéene. [**A Fresh Case of Blackwater Fever.**]—*Bull. Soc. Path. Exot.* 1925. July 8. Vol. 18. No. 7. pp. 590–592. [1 ref.]

Reference is made to a previous note relating to a case of blackwater fever, in the blood of which malaria parasites were present during the haemoglobinuria, which was treated successfully with quinine. A second case of the same kind is reported.

W. Y.

FERGUSON (H. R. M.). **Case of Blackwater Fever in African Child.**—*Nigeria Ann. Med. & San. Rep. for the Year 1923.* Appendix IV. p. 35.

A few details are given concerning an attack of blackwater in an African girl aged four years. The urine was typical of blackwater fever, the patient had been vomiting, was jaundiced, and had a large and tender spleen. Quinine hydrochloride grs. 3. was given twice daily, and in 4 days the urine was clear. The blood was not examined.

W. Y.

HUCHARD (G. L.). Hémoglobinurie et quininothérapie. [**Blackwater Fever and Quinine.**]—*Bull. Soc. Path. Exot.* 1925. Mar. 11. Vol. 18. No. 3. pp. 289–292.

Clinical details are given of a case of blackwater fever and of the treatment administered. Certain conclusions are drawn [which in the reviewer's opinion are unjustifiable from an observation on a single case].

W. Y.

CARMODY (Ernest P.). **Some Observations on Blackwater Fever.**—*Brit. Med. Jl.* 1925. Jan. 17. pp. 106–107.

An account is given of the author's observations on, and method of treating, 36 cases of blackwater fever in the Bindura district of Southern Rhodesia.

W. Y.

CALOV (W. L.). Some Notes on a Series of Cases of Blackwater Fever in the Territory of New Guinea.—*Med. Jl. Australia.* 1925. Sept. 26. 12th Year. Vol. 2. No. 13. pp. 396–398.

MISCELLANEOUS.

FERNANDO (Antonio S.) & NICHOLAS-FERNANDO (Felisa). **Tropical Oto-Laryngology with Special Reference to the Philippine Islands.** —*Jl. Trop. Med. & Hyg.* 1925. June 1. Vol. 28. No. 11. pp. 202–207.

The authors have studied the cases in the ear, nose and throat department of the Philippine General Hospital, where some 6,000 cases are seen yearly, over a period of six years. They tabulate the frequency of the various affections and draw attention to the high incidence of acute rhinitis and tonsilitis in certain periods of the year the frequency of middle-ear suppuration among poor children, the frequency of furunculosis of the ear, the relative frequency of atrophic rhinitis in young girls and women who lead a sedentary life, and the comparative absence of deviations of the septum. They discuss the climate, the social conditions of the people and their primitive methods of treatment, *e.g.*, many auditory affections may be traced to the Chinese barber who removes wax with his one set of never-sterilized instruments. They add notes on the conditions seen in this department which are due to leprosy, yaws and beriberi.

A. G. B.

LANGERON (Jean). La médecine chez le noir. A propos d'une de leurs entités cliniques. Le "Kapopo." [**"Kapopo" in Negroes in Central Africa.**]—*Bull. Méd. du Katanga.* 1925. Apr. Vol. 2. No. 2. pp. 57–59.

"Kapopo," so named by the Rhodesian natives and the Basanga, has probably more than one origin. Necrosis of the subcutaneous tissues and deeper layers is followed by deformities and fistulous sores; the development is slow and is unhindered by treatment. The author thinks some cases are late syphilis or yaws; others have a mycotic cause. Novarsenobenzol in one case and Lugol's solution in the other may lead to recovery.

A. G. B.

HENDRIKS (J. A.). Statistiek eener bergkampong. [**Statistics of a Mountain Village.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1925. Vol. 65. No. 2. pp. 212–218. With 1 text fig.

Hendriks kept records of the population of a mountain village (altitude, 1,200 metres) without endemic tropical diseases, as well as of a village in the plain, where malaria is common. The mortality was 35·4 per 1,000 in the latter, against 12·3 per 1,000 in the first [*i.e.*, lower than the average in Holland during the last 10 years, 12·6 per 1,000]. The birth rate was high in both places (31·9–31·4 per 1,000). The malaria mortality concerns in the first place the children. Malaria has no influence on the birth rate.

W. J. Bais.

NIKOLAI (A.) & TIJSSEN (J.). Vervalschte of minderwaardige oleum chenopodii? [**Adulterated or Inferior Chenopodium Oil?**] — *Geneesk. Tijdschr. v. Nederl.-Indië.* 1925. Vol. 65. No. 2. pp. 248–253.

During 1924, Nicolai noted a marked increase of the hookworm admission rate in his hospital and longer duration of the disease after the chenopodium cure than in previous years. Other apparent reasons being absent, the chenopodium oil in use was thought to be of inferior quality. It was a cheap brand of the oil which, however, did not markedly differ in appearance or in smell from the usual supply. Seven hookworm patients received a cure with the suspected oil (48 drops) followed by one with other chenopodium oil. Of the total number of worms expelled by these two cures 22 per cent. fell to the first cure (the percentage to be expected with superior oil being 90). From the records of VERVOORT's original experiments with chenopodium oil Tijssen found that 13 drops of the oil followed by a test cure expelled 41 per cent. of the worms. The suspected oil thus appeared to develop only a fraction of the normal activity. Its physical characteristics practically responded to the standard of the U.S. Pharmacopoea; therefore the oil could hardly be adulterated, but is merely to be considered as an inferior quality. The existence of chenopodium oil of low activity has not been reported so far.

W. J. Bais.

NICHOLLS (Lucius). **Immunisation to Bacterial Diseases by Absorption through Mucous Membranes or the Skin.**—*Ceylon Jl. Sci.* (Section D. Med. Sci.) 1925. Apr. 27. Vol. 1. Pt. 2. pp. 99–105.

The author draws attention to the wide field in the tropics for immunization against bacterial diseases by ingested vaccines or applications to the skin if more definite proofs of BESREDKA's claims can be obtained. He has carried out a series of experiments on animals at Colombo, for the details of which the paper must be consulted. Rabbits received plague and pneumococcal vaccines by the mouth, the rectum or by skin friction, but showed no signs that absorption of the vaccines into the general system had occurred. The author thinks that some general absorption of and reaction to vaccines is necessary for the production of immunity. Intranasal injection of vaccines of *B. pestis* and pneumococcus was followed by some immunity to the respective organisms. He relates an experiment in East Africa during the war in which vaccines of *B. dysenteriae* were given by the mouth to native labourers in the carrier corps:—

"The vaccine was prepared by inoculating a 2-litre flask of sterile milk with a freshly isolated culture of *B. dysenteriae* (Shiga). The flask was incubated for 24 hours and sterilized by heating to 60° C. for half an hour. The milk acquired no taste or scent, and the dose used was from 1 to 3 cc. On the day after the vaccine had been taken almost all the recipients had slight diarrhoea, which varied from one loose stool to three or four stools containing a small quantity of blood and mucus. A dose of 1 cc. of the vaccine usually caused the passage of a loose stool which did not contain blood or mucus. But 3 cc. of the vaccine almost invariably caused the passage of blood and mucus. A slight malaise and some griping occurred in many cases. But all the patients had fully recovered in 24 hours . . .

"It is reasonable to suppose that some immunity would result from this mild and transient attack of dysentery."

Unfortunately the after-history of these cases could not be obtained.

A. G. B.

MILLS (Ralph G.). **The Possible Relation of Copper to Disease among the Korean People.**—*Jl. Amer. Med. Assoc.* 1925. May 2. Vol. 84. No. 18. pp. 1326–1327. [7 refs.]

MALLORY and others have demonstrated a relation between chronic copper poisoning and haemochromatosis, in which condition diabetes of the bronzed type is common. The Koreans use brass at every phase of the preparation and storage of their food, some of which must have some solvent action; even a family in reduced circumstances will cling to its brass bowls. The Koreans should therefore suffer from haemochromatosis. However, in a series of 100 post-mortems, no disturbance of pigmentation of the internal organs was noticed, and in 3,045 routine hospital examinations of urines, only two cases of diabetes came to light; in another series the diabetics formed 0·1 per cent. of the hospital clientèle. Cirrhosis of the liver of unknown origin is common among Koreans, especially girls below the age of 15; possibly this is due to copper intoxication. Workers in brass in Korea do not suffer from any trade disease. {Is not this use of brass vessels common to many Asiatic peoples?}

A. G. B.

LHUERRE (H.). De la rareté des luxations chez les indigènes de l'A.O.F. **Rarity of Dislocations in French West Africa.**—*Bull. Soc. Path. Exot.* 1925. Mar. 11. Vol. 18. No. 3. p. 293.

Attention is drawn to the rarity of dislocations among native patients in West Africa. In the register of the X-ray department of the native hospital of Dakar for the last five years only two cases of dislocation are recorded, against 170 cases of fracture.

A. A.

GUPPY (H. B.). **A Reminiscence of Sir Patrick Manson at Amoy.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1925. Jan. 15. Vol. 18. No. 7. pp. 385–386.

The author writes with admiration of the exalted spirit that animated the Consular Service, the Imperial Customs Service, and the Medical Profession in China, when he was on that Station as a naval surgeon in 1877–80. All the doctors were capable men, versatile and efficient. "Of such a type was PATRICK MANSON, working with his microscope amongst his Chinese patients in his private hospital at Amoy, his appearance of health and vigour more suggestive of a British hunting squire than of a student on the eve of a discovery that has wrought so much for the benefit of mankind."

There was cholera in Amoy; the dead and dying were lying in the streets, and when the writer asked what he ought to do, MANSON promptly answered, "Write a letter, on service, to your captain, and advise him to leave at once."

A. A.

SERGENT (Edmond), PARROT (L.) & DONATIEN (A.). **On the Necessity of having a Term to express the Resistance of Carriers of Germs to Super-imposed Infections.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1925. Jan. 15. Vol. 18. No. 7. pp. 383–385. [5 refs.]

From the point of view of immunity the authors recognize two kinds of infectious diseases, namely: (1) Those, such as smallpox, scarlet fever, measles, etc., that produce a permanent immunity, which,

although the attacking microbes have disappeared, renders re-infection "impossible"; and (2) those, such as malaria, that, after an acute stage, remain as a chronic infestation during the continuance of which re-infection is impossible, though re-infection is possible after the chronic infestation is brought to an end.

To diseases of the first kind—acute diseases followed by a true solid resistance—the authors would restrict the application of the terms "immunity," "immunization," "immunized," "immune," etc. For diseases of the second kind—chronic diseases giving a good resistance only so long as the chronic infection is lasting—they propose as corresponding terms "premunition," "premunized," etc., substituting the prefix *prae* or *pre* for the prefix *im* throughout the series of terms. And they request their British colleagues to consider the possibility of giving currency to the verb "premunize," the substantive "premunition," and the adjective "premunized." "Words," as Thomas Hobbes said (though the saying is commonly attributed to his contemporary, Bacon), "are wise men's counters, they do but reckon by them"; and if they are wanted for reckoning they can pass into use without formality.

A. A.

CUNNINGHAM (J.) & RAMAKRISHNAN (S.). **The Classification of the Streptococci found in Tropical Affections.**—*Indian Jl. Med. Res.* 1925. Jan. Vol. 12. No. 3. pp. 481–485. [5 refs.]

The authors have subjected all streptococci received in the King Institute from human pathogenic sources to a detailed examination with a view to their further differentiation, and have followed the classification of HOLMAN, who divides them into 16 types, 8 haemolytic and 8 non-haemolytic, based on differences in the fermentation of lactose, mannite and salicin. They have examined 141 strains and set forth their results in a Table. Haemolytic and non-haemolytic strains were found in almost equal number. Most of their strains came from mild skin affections and the mouth, throat and nose. The frequency of certain groups differs from that of other observers, chiefly in America, and this is attributed to the different sources from which they collected their material. It is suggested that the types of streptococci found in the severer infections do not differ from those found in similar cases in temperate climates.

A. G. B.

KINGSBURY (A. Neave). **A Note on the Alleged Deterioration of Insulin in the Tropics.**—*Lancet.* 1925. Jan. 3. pp. 18–19. [5 refs.]

Although Bose reported favourably on the stability of insulin in the tropics the majority of writers are of opinion that its potency is lessened by even a short storage in a tropical temperature, an opinion corroborated by the ample and careful observations of STOTT on diabetics. The present author makes known the results of some experiments at Kuala Lumpur that reconcile these contradictory opinions in so far as they are based on experiments upon rabbits in the tropics. A sample of insulin after being stored for six months in a building in which the average temperature during that term was 79·6° F. at 9 o'clock a.m., 84° at noon, and 83·5° at 3 o'clock p.m., was re-assayed on "local" rabbits and appeared to have deteriorated about 40 per cent. It was also re-assayed on the first generation of imported rabbits and showed little, if any, deterioration.

Apart from this question as to the suitability of rabbits for insulin-testing in the tropics, the author points to STOTT's work as evidence that dissociation occurs in some samples of insulin and to CHEADLE's experiments —clinically confirmed by himself—as to the influence upon insulin of the pH concentration.

A. A.

TROCCHIO (L.) & CRUTO (A.). **On the Influence of High Temperature on the Preservation of Insulin.** —*Jl. Trop. Med. & Hyg.* 1925. Mar. 2. Vol. 28. No. 5. pp. 103–105. [1 ref.]

Experiments made in Europe on rabbits with insulin, solid or in solution. The solid form had not lost potency after 35 days at 42° C.; the liquid form lost about one-half.

A. G. B.

YAKIMOFF (W. L.) & WASSILEWSKY (W. J.). Au sujet de la blastocystose. [**Blastocystosis.**]—*Bull. Soc. Path. Exot.* 1925. Feb. 11. Vol. 18. No. 2. pp. 130–132. [1 ref.]

The main of this paper from Petrograd consists of brief abstracts of three cases diagnosed—from the leading symptoms of abdominal pain, diarrhoea, and glairy or muco-sanguineous liquid stools—as haemorrhagic colitis, in which the only micro-organism discovered in the stools was *Blastocystis hominis*. In one case 2 specimens of *Ascaris lumbricoides* were passed. The authors have also observed cases where blastocystis provoked only diarrhoea.

A. A.

WOLBACH (S. Burt). **The Rickettsiae and their Relationship to Disease.** —*Jl. Amer. Med. Assoc.* 1925. Mar. 7. Vol. 84. No. 10. pp. 723–728. [30 refs.]

This is a survey and summary of the subject from 1916 when ROCHA-LIMA gave the name "Ricksettsia" to certain minute "micro-organisms" found in lice. It does not contain any additions to a theme of which the author is a leading exponent, whose work has been frequently noticed in this *Bulletin*. It is sufficient, therefore, to quote his conclusions :—

"The term 'rickettsia' should be applied only to micro-organisms adapted to arthropods ('insects') and pathogenic for vertebrates and having the following characteristics: small size, pleomorphism, slight affinity for aniline dyes and intra-cellular habitat in the arthropod host.

"We should keep in mind that we know practically nothing about the non-pathogenic, rickettsia-like, intracellular micro organisms of arachnids and insects, whether casually present or in the rôle of symbionts. The work so far done in this field has been superficial and evasive of the main problems concerning relationships between micro organisms and hosts; it has, however, served to obscure the status of the pathogenic rickettsiae. That *Dermacentroxenus rickettsi* is the cause of Rocky Mountain spotted fever, and that *Rickettsia prowazeki* is the cause of typhus, I regard as proved. There is strong presumptive evidence that *Rickettsia pediculi* is the cause of trench fever. It is certain that the rickettsiae represent a new group of micro-organisms, and probable that other pathogenic ones will be found."

[Full references to original papers are given in footnotes, but we may refer here to the following notices in this *Bulletin* : Vol. 15, p. 309 ; Vol. 16, p. 420 ; Vol. 18. p. 262 ; Vol. 20, pp. 387, 660, 677, 789, 808 ; Vol. 21, pp. 664, 674, 917.]

A. A.

LHUERRE (H.). Sur l'emploi des Appareils plâtrés dans les pays chauds. [**Plaster Apparatus in Hot Countries.**]—*Bull. Soc. Path. Exot.* 1925. Jan. 14. Vol. 18. No. 1. pp. 118–119.

The author finds that at Dakar plaster applied for the immobilization of fractures, though it sets well in the dry season, fails to do so in the wet season ; a failure which he attributes to the atmospheric humidity. For the present he has returned to extension and counter-extension.

A. G. B.

HOFFMANN (W. H.). Das weisse Blutbild im Anschluss an die Schutzpockenimpfung. [**The Leucocyte Formula after Smallpox Vaccination.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Feb. Vol. 29. No. 2. pp. 67–68. [1 ref.]

During an epidemic of smallpox in Havana the author observed the blood changes in 12 persons after vaccination : 21 observations in all. His result, set forth in a table, confirm those of SHINTAKE [*Arch. f. Schiffs-u. Trop.-Hyg.*, Vol. 28, p. 62.]. There was leucocytosis, lymphocytosis, a shift to the left of the Arneth index and an eosinophilia. These changes are compared with those of smallpox [this *Bulletin*, Vol. 21, p. 332].

A. G. B.

BROSIUS (Otto T.). **Some Extra-Luetic Therapeutics of Dioxydiamidoarsenobenzol and its Modifications.**—*Amer. Jl. Trop. Med.* 1925. Jan. Vol. 5. No. 1. pp. 27–40.

In his hospital at Barranquilla, Colombia, the author has given over 1,500 intravenous injections of novarsenobenzol or its variants, and of these 600 for diseases other than syphilis and 400 for malaria. He finds that one injection of the drug is useless in one-fourth of cases of malaria, in one-fourth of chronic cases the drug cures both benign and malignant tertian, without quinine, and in one-half of chronic cases it is excellent after an incomplete quinine course. It needs to be repeated, and it has the advantage of cutting short the period of disability. The arsenical can usually be given after 10–14 days' quinine treatment. Illustrative cases, some striking, are given. The author prefers large doses, 0·75 or 0·6 gm., and has seen gametes persist where a course was started with a dose of 0·3 gm.

Novarsenobenzol cures certain myalgias in the tropics permanently, as in a case cited where there was no luetic factor and one injection sufficed.

About a dozen cases of amoebic dysentery were refractory to emetine and bismuth treatment till novarsenobenzol had been administered ; illustrations are given, in some of which there was no evidence of syphilis. A type of pinta or caraate disappears under 2 or 3 injections of novarsenobenzol.

A. G. B.

MACVICAR (Neil). **Condition of the Teeth in Native Adolescents.**—*S. African Med. Rec.* 1925. Jan. 10. Vol. 23. No. 1. p. 11.

The author examined the teeth of 138 Bantu girls of 14 years and upward who entered the Lovedale Institution in 1910–12; most came from the Cape Province. Of these 138 96 (or 70 per cent.) had perfect teeth; 40 others had among them 68 imperfect or missing teeth. These figures compare very favourably with those from a series of white children collected by BROWN in the Cape Province, only 28 per cent. of whom were free from caries.

A. G. B.

D'ANFREVILLE DE LA SALLE. Au sujet de l'enquête sur l'alimentation des indigènes de nos colonies au point de vue de leur résistance aux fléaux et à celui de repeuplement.—*Rev. Méd. et Hyg. Trop.* 1924. Aug.–Dec. Vol. 16. No. 6. pp. 167–173.

BIDEAU. Notes médicales recueillies pendant la campagne de l' "Antarès" sur la côte occidentale d'Afrique, au Brésil et aux Antilles (1922–1923).—*Arch. Méd. et Pharm. Nav.* 1925. July–Aug.–Sept. Vol. 115. No. 3. pp. 218–234.

COWDRY (E. V.). Medical Research in China.—Reprinted from *Science.* 1925. Oct. 23. Vol. 42. No. 1608. pp. 374–377.

DUBOIS (Albert). La pathologie exotique en 1924–1925.—*Bruxelles-Méd.* 1925. Nov. 8. Vol. 6. No. 2. pp. 25–33. [1 ref.]

HAPKE (F.). Ein geheilter Fall von Chininidiosynkrasie.—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. July 1. Vol. 29. No. 7. pp. 343–344.

HARRIS (D. T.). Studies on the Biological Action of Light.—*Proc. Roy. Soc.* 1925. June 2. Ser. B. Vol. 98. No. B. 688. pp. 171–187. With 13 text figs. [23 refs.]

JAMISON (S. Chaille). Sickle Cell Anemia: Case Report.—*Southern Med. Jl.* 1925. Nov. Vol. 18. No. 11. pp. 795–796. With 1 text fig. [7 refs.]

LISTER (Spencer). The Work of the Laboratory in Relation to the Practice of Medicine.—*Med. Jl. S. Africa.* 1925. Aug. Vol. 21. No. 1. pp. 12–15.

LOEVENBRUCK. Deux cas d'encéphalite lethargique chez des indigènes.—*Bull. Méd. du Katanga.* 1924. Dec. Vol. 1. No. 6. pp. 247–249.

NAKADATE (Kohkichi). Vergleichende Untersuchung ueber die Rassenhygiene mit besonderer Beruecksichtigung der Japaner in der Sued-Mandschurei.—*Jl. Oriental Med.* 1925. May. Vol. 3. No. 2. German summary pp. 57–59. [In Japanese.]

NARASIMHAN (N. S.). A Case of Contracture of the Mouth.—*Indian Med. Gaz.* 1925. Feb. p. 72.

PATENOSTRE. Notes sur la médecine et l'obstétrique indigènes en Afrique occidentale française.—*Ann. de Méd. et de Pharm. Colon.* 1925. May–June–July–Aug. Vol. 23. No. 2. pp. 332–339.

REYNAUD (G.). Médecins et Colonies: colonies à assainir—médecins à recruter.—*Presse Méd.* 1925. June 3. Vol. 33. No. 44. pp. 739–740. [8 refs.]

SPITTEL (R. L.). The Art of the Indian Chiropodist.—*Indian Med. Gaz.* 1925. July. Vol. 60. No. 7. pp. 316–317. With 3 text figs.

WARNOCK (John). Twenty-eight Years' Lunacy Experience in Egypt (1895–1923).—*Jl. Mental Science.* 1924. Apr., July & Oct. Vol. 70. Nos. 289, 290 & 291. pp. 233–261; 380–410; 579–612.

REVIEWS AND NOTICES.

HÖJER (J. Axel). [Former First Assistant at the Children's Clinic of the Karolinska Institute, Stockholm.] **Studies in Scurvy.**—*Acta Paediatrica.* Upsala. 1924. May 17. Vol. 3. (Supplement.) 278 pp. With 6 coloured plates, 94 micro-photographs & 33 charts.

The main interest of this book on scurvy, which has the character of an elaborate thesis submitted for a higher University degree, lies in the complete study presented of the pathological anatomy of the disease as produced experimentally in the guineapig. In addition, a description is given of an investigation of the relation between a scorbutic condition of the organism and its resistance to tubercular infection.

Each section of the book contains a detailed summary of the literature and history of the subject. Beginning with a discussion of the various methods employed for inducing scurvy in the guineapig, the author describes some of his own endeavours to evaluate the antiscorbutic potency of certain fruits and vegetables. In some cases the values obtained are not in accord with those of other workers, and, in explanation, the author suggests that the antiscorbutic value of particular fruits may be dependent upon the amount of sunshine received during ripening. This theory, however, is in opposition to the results obtained by other workers, who have found antiscorbutic properties in plants grown with minimum incidence of light.

In the chapters devoted to pathological anatomy, a complete study is made of the histology of the organs and tissues of guineapigs suffering from scurvy in all degress of severity. With the exception of the lungs all the tissues examined showed pathological changes. Most space is devoted to the histology of the teeth and bones. A somewhat new theory is advanced to explain the appearances shown by scorbutic bone in the growing animal, viz., that these are caused by failure of the osteoblasts to discharge their normal function of forming new bone tissue, while the process of calcification is unhindered. As a result, in the teeth and lower jaw, and also in the shafts of the long bones, this pathological bone is porous and brittle, while fully calcified.

The other tissues examined include the muscles, heart, liver, spleen, kidneys, adrenal and salivary glands, lungs, blood, blood vessels and connective tissue. The muscles, heart, liver and kidneys showed well-marked atrophy and in addition necrosed areas impregnated with deposits of lime salts. In the opinion of the author these deposits in the kidney suggest that an abnormal excretion of calcium salts is taking place through this organ. The haemorrhages characteristic of scurvy are explained as due partly to weakness in the vascular wall, caused by lack of connective tissue therein, and partly to the deficient support given by the atrophic tissues outside.

In the chapters on scurvy and tuberculosis, experiments are described in which removal of antiscorbutic materials from the diet appeared to shorten the life of guineapigs infected with tuberculosis, and to increase the severity of the lesions. Conversely, in a "human experiment," carried out in the spring of the year upon 44 patients in a tuberculosis sanatorium, the addition of extra antiscorbutic to the diet in the form of an orange a day caused favourable progress in comparison with patients to whose diet no such addition was made.

Although the book is written in admirable English, some slightly unusual expressions render the meaning a little obscure in some of the more detailed passages.

Harriette Chick.

JAPANESE JOURNAL OF MEDICAL SCIENCES. **Abstracts.**—Vol. 2. No. 1. pp. 1–51; No. 2. pp. 53–134; No. 3. pp. 135–238. 1924–25. Tokyo: National Research Council of Japan.

The second volume of the *Japanese Journal of Medical Sciences Abstracts* (National Research Council of Japan) has recently reached the Bureau. It consists entirely of abstracts in German or English of papers published in Japan between January and June, 1922. Of three fascicles, No. 1 deals with physiology, biochemistry and bacteriology, and contains 19, 91 and 123 abstracts; No. 2 with anatomy, hygiene, protozoology and serology (201, 19, 2, and 40); No. 3 with pathology (204) and pharmacology (32). Under pathology some 35 articles on helminth infection are summarized. The value of such work would be materially increased if publication were more prompt.

A. G. B.

BEIHEFTE ZUM ARCHIV FÜR SCHIFFS- UND TROPEN-HYGIENE. 1925. Vol. 29. No. 1. pp. xv+496. With 47 plates, 6 charts & 13 text figs. Festschrift des Hamburgischen Instituts für Schiffs- u. Tropenkrankheiten zum 25 Gründungstage am 1. Oktober 1925. [**Volume Commemorative of the 25th Anniversary of the Institute for Ship- and Tropical Diseases, Hamburg.**] Leipzig: Verlag von Johann Ambrosius Barth. [Price Rm. 24.]

This is a kind of jubilee book to celebrate the twenty-fifth anniversary of the foundation of the Hamburg School of Tropical Medicine, and like the generality of its class, is remarkable more for profusion and variety than for uniform profundity. It is ceremonially introduced by Dr. TAUTE, and in its long list of contributors are to be seen names from many parts of both hemispheres, including two from our own dominions. We may mark here its range and a few of the salient points touched in its course, leaving further particulars to the future attention of the sectional editors.

There are five papers on malaria in various aspects; but the most serious contribution to this subject occurs, incidentally, in a superbly illustrated essay by Hermann DÜRCK, entitled "Foci of neurologia-proliferation associated with diseases of the central nervous system," where, among other things, the formation of perivascular granulomata in the malarial brain receives very full attention both in text and in plates. Of six papers on dysentery of protozoan causation, two deal exclusively with Yatren treatment, and one is a good study of balantidium infection in man and ape. Among five papers on spirochaetoses, one of a ratiocinative kind by MANTEUFEL & WORMS on percutaneous inoculation is significant and contains a bibliography which is not exclusively German; and another by SEYFARTH *et al.* of an experimental kind on the behaviour of the relapsing spirillum appears to be interesting. A paper by WALCH *et al.* on pseudo-typhus in Sumatra may be mentioned, and one by Tewfik SALIM, of Constantinople, on antityphus vaccination with the blood of typhus patients contains some statistics and conclusions that may be useful. Attention may be directed to a contribution by FLU on the cholera bacteriophage. There are two serious studies on Verruga peruana, one by MACKEHENIE & WEISS, the other, illustrated, by MONGE. The contributions on skin diseases also include one on the treatment of pemphigus contagiosus with stibenyl. There are about a dozen papers on various branches of medical zoology, and here, perhaps, may be mentioned two by SCHILLING on the Chlamydozoa and one by MARZINOWSKY on the pathology and parasitology of canine leishmaniasis. Other subjects touched in varying measure are bacteriology, blackwater fever treatment, pathology, racial physiology, therapeutics, venereal disease in New Guinea, yaws, and minor questions of hygiene. The illustrations are a prominent and elegant feature of a praiseworthy book.

A. Alcock.